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(54) Title: SMOKING ARTICLE, WRAPPER AND METHOD OF MAKING SAME

(57) Abstract

A wrapper for smoking article which, when wrapped about a tobacco column, provides improved mainstream smoke taste and sidestream smoke odor subjectives. These objectives are attained by forming a cellulosic sheet containing a small amount, but less than about 2 %, of activated carbon having absorbed onto the carbon a volatile flavorant.

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SMOKING ARTICLE, WRAPPER AND METHOD OF MAKING SAME

REFERENCE TO RELATED APPLICATIONS

5 This application is a continuation-in-part of Application Serial No. 07/656,497, filed February 19, 1991, to issue as U.S. Patent 5,107,864, on April 28, 1992.

SUMMARY OF THE INVENTION

10 This invention provides a regular, reduced sidestream smoke or heavy weight cigarette paper or cigar wrapper which, when fabricated into a cigarette or cigar with a suitable tobacco column, statically burns at an acceptable rate, produces a light-colored, well-formed 15 ash, which clings tightly without premature flaking and delivers both mainstream and sidestream smoke with a subjectively pleasant taste and aroma. More specifically, these desirable taste and aroma properties are achieved when certain defined levels of activated 20 carbon, which contain certain levels of volatile flavors absorbed thereon, are incorporated into the sheet matrix of the cigarette paper or cigar wrapper or are applied to the surface (preferably on the inside-wire side-surface of the cigarette paper) which encloses the tobacco 25 column. Flavors can be absorbed onto all or part of the carbon. Incorporation of the flavor-absorbed carbons into the sheet matrix to give desirable taste and aroma, as well as acceptable cigarette paper appearance, can be

accomplished by maintaining a sheet carbon content of less than 2% carbon (preferably 1% or below) with the carbon particle size being such to totally pass through a 200 mesh screen (ASTM E-11 test) and preferably totally 5 through a 325 mesh screen.

The term, volatile flavorant, as used herein, pertains to a flavorant that volatilizes from the carbon at temperatures below the combustion temperature of the carbon, for example, at temperatures between about 50°C 10 and 300°C.

BACKGROUND OF THE INVENTION

U.S. Patent 3,744,496, assigned to Olin Corporation, discloses a carbon-filled paper to wrap cigarettes and/or cigars, preferably used as an inner liner with regular 15 cigarette paper or cigar wrapper as an outer wrap. The paper described in U.S. Patent 3,744,496 contains at least 5% carbon, thus making the appearance of the paper unacceptable for use as a white cigarette paper.

PARAMETERS OF THE INVENTION

20	Activated Carbon Content:	A small amount up to less than 2% Preferred	0.1% to 1.0%
	Magnesium Hydroxide Content:	0.0% to 35% Preferred	0.0% to 20%
25	Calcium Carbonate Content:	5.0% to 40% Preferred	10% to 30%
	Basis Weight:	20 gm/m ² to 100 gm/m ² Preferred	25 gm/m ² to 65 gm/m ²
30	Porosity:	1 to 200 Coresta Preferred	5 to 125 Coresta

	Flavorants: Specific	Vanillin, ethyl vanillin, 3 methyl pentanoic acid, ethyl valerate, isoamyl isovalerate
5	General	Volatile, stable flavorants used in cigarette and cigar production
10	Burning Chemical:	Alkali metal salts of organic acids selected from the group consisting of citric, malic, lactic, glycolic, tartaric, fumaric, maleic, malonic, glutaric, adipic, acetic, and succinic
15	Burning Chemical Addition rate:	0.5% to 6.0%
20	Acid Addition:	0.0% to 10% organic or inorganic acid compatible with the alkali metal salt burning chemical
25	Sugar Addition:	0.0% to 10% mono-, di-, tri-, or polysaccharides
	Smoking Articles:	Cigarettes, cigars, and the like

DESCRIPTION OF THE INVENTION

30 It has been found that by putting low levels (less than 2% of the finely pulverized activated carbon having volatile flavorants absorbed thereon into regular, reduced sidestream smoke or heavy weight cigarette papers or coated onto the surface of the cigarette paper, an enhancement in mainstream smoke taste and/or sidestream smoke aroma can be effected. With proper selection of both the carbon type and particle size, type flavorants

35

and level of flavorant treatment of the carbon, cigarette and cigar products can be produced which have totally acceptable appearance (light gray-white for cigarettes and tan to brown for cigars), while possessing enhanced 5 mainstream smoke taste and sidestream smoke aroma. The truly novel findings resulting from this invention are (1) the discovery that when certain particle sizes (very fine) of carbon incorporated at certain levels (below 2%) into cigarette type papers, totally acceptable appearance 10 of cigarettes and cigars can be produced, and (2) at these levels of carbon (less than 2%), sufficient levels of certain volatile flavorants can be absorbed onto the carbon to effect significant enhancements of both mainstream smoke taste and sidestream smoke aroma as the 15 cigarette/cigar product is smoked.

This development can be utilized with acid treatments of the carbon or total paper, as per U.S. Patent Application Serial No. 514,533, Owens, filed April 26, 1990; U.S. Patent Application Serial No. 20 756,542, Owens, filed September 9, 1991; U.S. Patent Application Serial No. 756,543, Owens, filed September 9, 1991; and U.S. Patent Application Serial No. 756,544, Owens, filed September 9, 1991; and with addition of sugars to give improved ash characteristics.

25 PREFERRED EMBODIMENTS

Typical results demonstrating the effects obtained in accordance with this invention are described in the

following examples, which are illustrative of the invention only and are not in limitation thereof.

Example I:

Carbon Treatment

5 Two grams of ethyl vanillin dissolved in 2 grams of 95% ethyl alcohol were added to 8 grams of GX 248 activated carbon from North American Carbon, Inc. The mixture was well mixed and allowed to stand overnight before being used to prepare handsheets. Handsheets were
10 prepared of regular type cigarette paper having the following properties: Basis weight of 25 gm/m² containing 25% low surface area calcium carbonate and 1% of the ethyl vanillin treated carbon as prepared above. The handsheets were dried duplicating paper machine drying
15 conditions and treated with a 2.0% solution of potassium citrate and redried again duplicating paper machine drying conditions. The resulting paper had a blue-white color and was cut into 27.5 mm x 65 mm strips. Filtered king-size cigarettes (20 mm filter, 65 mm tobacco column)
20 were prepared, using the handsheet cigarette paper, prepared as described above, as the cigarette wrapper. On smoking of the cigarette containing the ethyl vanillin treated carbon wrapper, a definite aroma of ethyl vanillin was observed in the sidestream smoke, and a
25 pleasant vanillin taste was present in the mainstream smoke. Appearance of the cigarette was totally

acceptable, having a normal grayish cast caused by the tobacco show-through of the paper.

Example II:

To 10 grams of GX 250 activated carbon from North America Carbon, Inc., was added 0.050 grams of 3 methyl pentanoic acid. The treated carbon was well mixed and allowed to stand overnight. Reduced sidestream smoke cigarette paper handsheets were then prepared having the following properties: Basis weight of 45 gm/M² containing 10% magnesium hydroxide prepared, as described in U.S. Patent 4,915,118, 30% Ecusta low surface area calcium carbonate and 0.5% of the above-treated carbon. The handsheets were dried, as in Example I, and then treated with a 6.5% solution of potassium citrate and 1% sulfuric acid and redried. The potassium citrate and 1% sulfuric acid and redried. The resulting paper had a blue-white to very light gray color and was cut into 27.5 mm x 65 mm strips. Filtered king-size cigarettes (20 mm filter, 65 mm tobacco column) were prepared, using the handsheet 15 reduced sidestream smoke cigarette paper, as described above, as the cigarette wrapper. On smoking of the cigarette containing the 3 methyl pentanoic acid treated carbon wrapper, a definite enhancement of tobacco taste was noted in the mainstream taste, and an enhancement of 20 the tobacco aroma was noted in the sidestream smoke. 25 Appearance of the cigarette was totally acceptable.

TABLE I (PART 1) - FLAVORANT TREATED CARBON

<u>Flavorant</u>	<u>Weight gm/M²</u>	<u>Type Carbon</u>	<u>% Carbon in Paper</u>	<u>% Carbon Treatment</u>	<u>Flavorant Treatment Per Cig. (Mg)</u>	<u>M^{2***}</u>
Ethyl Vanillin (a)	25	GX248 1	1.0	25	0.11	62.5
Ethyl Vanillin	25	GX248	2.0	25	0.22	125.0
Ethyl Vanillin	25	GX248	0.5	25	0.06	31.3
Ethyl Vanillin	45	GX248	1.0	25	0.20	112.5
Ethyl Vanillin	45	GX248	0.5	25	0.10	56.3
Ethyl Vanillin	45	GX248	0.25	25	0.05	28.1
Ethyl Vanillin	45	GX248	1.0	12.5	0.10	56.3
Ethyl Vanillin	45	GX250 2	1.0	12.5	0.10	56.3
Ethyl Vanillin	45	GX250	2.0	12.5	0.20	112.5
Ethyl Vanillin	45	GX186 3	1.0	12.5	0.10	56.3
Ethyl Vanillin	45	P100 4	1.0	12.5	0.10	56.3
Ethyl Vanillin	45	GX224 5	1.0	12.5	0.10	56.3

TABLE I - (PART 2) - FLAVORANT TREATED CARBON

Flavorant	Comments	Paper Color	Cigarette Appearance
Ethyl Vanillin ^(a)	Good EV taste/odor	Blue White	Acceptable
Ethyl Vanillin	Strong EV taste/odor	Light Gray	Acceptable
Ethyl Vanillin	Low/detectable EV	Light Blue White	Acceptable
Ethyl Vanillin	Strong EV taste/odor	Very Light Gray	Acceptable
Ethyl Vanillin	Good EV taste/odor	Blue White	Acceptable
Ethyl Vanillin	Low/detectable EV	Light Blue White	Acceptable
Ethyl Vanillin	Good EV taste/odor	Very Light Gray	Acceptable
Ethyl Vanillin	Good EV taste/odor	Very Light Gray	Acceptable
Ethyl Vanillin	Strong EV taste/odor	Light Gray	Unacceptable
Ethyl Vanillin	Very low EV taste/odor	Black Specks	Unacceptable
Ethyl Vanillin	Good EV taste/odor	Very Small Black Specks	Unacceptable
Ethyl Vanillin	very low EV taste/odor	Small Black Specks	Unacceptable

TABLE I - (PART 3) - FLAVORANT TREATED CARBON

<u>Flavorant</u>	<u>Weight gm/M²</u>	<u>Type Carbon</u>	<u>% Carbon in Paper</u>	<u>% Carbon Treatment</u>	<u>Flavorant Treatment Per Cig. (Mg)</u>	<u>M^{2***}</u>
3 MPA *	45	GX250	1.0	2.5	0.02	11.3
3 MPA	45	GX250	0.5	0.50	0.002	1.1
3 MPA	45	GX250	1.0	0.25	0.002	1.1
3 MPA	45	GX250	1.0	0.15	0.0012	0.7
3 MPA	45	GX250	1.0	0.05	0.0004	0.2
3 MPA	45	GX250	1.0	0.50	0.004	2.3
3 MPA	45	GX250	1.0	2.0	0.016	9.0
3 MPA	25	GX250	1.0	0.5	0.002	1.3
Chocolate **	45	GX250	1.0	10	0.08	45.0
IA-IV ***	45	GX250	1.0	10	0.08	45.0

TABLE I - (PART 4) - FLAVORANT TREATED CARBON

Flavorant	Comments	Paper Color	Cigarette Appearance
3 MPA *	Too strong, slightly bitter	Very Light Gray	Acceptable
3 MPA	Good enhanced tobacco taste	Very Light Gray	Acceptable
3 MPA	Good enhanced tobacco taste	Very Light Gray	Acceptable
3 MPA	Low enhanced tobacco taste	Very Light Gray	Acceptable
3 MPA	Minimal taste change	Very Light Gray	Acceptable
3 MPA	Strong enhanced tobacco taste	Very Light Gray	Acceptable
3 MPA	Too strong, slightly bitter	Very Light Gray	Acceptable
3 MPA	Good enhanced tobacco taste	Blue White	Acceptable
3 MPA	Good chocolate taste/aroma	Very Light Gray	Acceptable
Chocolate **	Good chocolate taste/aroma	Very Light Gray	Acceptable
IA-IV ***	Fruity aroma/taste	Very Light Gray	Acceptable

FOOTNOTES FOR TABLE I (PARTS 1 - 4)

- (a) Applied to carbon from a 50% ethyl alcohol solution
- * 3MPA = 3 Methyl pentanoic acid
- ** Chocolate = Firmenich Chocolate Flavor 587.593
- *** IA-IV = Isoamyl Isovalerate (Aldrich W20850-7)
- **** Cigarette Paper dimensions = 27.5 mm x 65 mm
- 1 GX248 Wood-based activated carbon from:
North American Carbon, Inc.
432 McCormick Boulevard
Columbus, Ohio 43213-1585
Particle Size ASTM E-11 = Greater than 98%
thru 325 mesh
 CCl_4 activity - 110% minimum
- 2 GX250 Wood-based activated carbon from:
North American Carbon, Inc.
432 McCormick Boulevard
Columbus Ohio 43213-1585
Particle size ASTM E-11 = Greater than 99%
thru 325 mesh
 CCl_4 activity - 110% minimum
- 3 GX186 Coconut shell-based activated carbon from:
North American Carbon, Inc.
432 McCormick Boulevard
Columbus, Ohio 43213-1585
Particle size ASTM E-11 = 2.2% on 50 mesh
88.2% on 140 mesh
9.6% thru 140 mesh
 CCl_4 activity - 60% minimum
- 4 P100 Wood-based activated carbon from:
North American Carbon, Inc.
432 McCormick Boulevard
Columbus, Ohio 43213-1585
Particle size ASTM E-11 = 8.4% on 200 mesh
26.5% on 325 mesh
73.5% thru 325 mesh
 CCl_4 activity - 110% minimum
- 5 GX224 Coconut shell-based activated carbon from:
North American Carbon, Inc.
432 McCormick Boulevard
Columbus, Ohio 43213-1585
Particle size ASTM E-11 = 10.1% on 80 mesh
66.8% on 325 mesh
23.1% thru 325 mesh
 CCl_4 activity - 60% minimum

CLAIMS

1 1. A wrapper for smoking articles, such as cigarettes,
2 cigars, and the like, comprising a cellulosic fiber sheet
3 containing a small amount, but less than about 2%, of
4 activated carbon having absorbed onto the carbon a volatile
5 flavorant.

1 2. The wrapper, as defined in Claim 1, wherein the
2 carbon content is from about 0.1% to about 1.0%.

1 3. The wrapper, as defined in Claim 2, wherein the
2 volatile flavorant is selected from the group consisting of
3 vanillin, ethyl vanillin, 3 methyl pentanoic acid, ethyl
4 valerate and isoamyl isovalerate.

1 4. The wrapper, as defined in Claim 2, wherein the
2 volatile flavorant volatilizes from the carbon at temperatures
3 between about 50°C and 300°C.

1 5. The wrapper, as defined in Claim 4, further
2 including 0.0% to 10% mono-, di-, tri-, or poly-saccharides.

1 6. A smoking article comprising a tobacco charge, such
2 as cigarettes, cigars, and the like, and a wrapper comprising
3 a cellulosic fiber sheet containing a small amount, but less
4 than about 2% of activated carbon having absorbed onto the
5 carbon a volatile flavorant.

1 7. The smoking article, as defined in Claim 6, wherein
2 the carbon content is from about 0.1% to about 1.0%.

1 8. The smoking article, as defined in Claim 7, wherein
2 the volatile flavorant is selected from the group consisting
3 of vanillin, ethyl vanillin, 3 methyl pentanoic acid, ethyl
4 valerate and isoamyl isovalerate.

1 9. The smoking article, as defined in Claim 7, wherein
2 the volatile flavorant volatilizes from the carbon at
3 temperatures between about 50°C and 300°C.

1 10. The smoking article, as defined in Claim 9, further
2 including 0.0% to 10% mono-, di-, tri-, or
3 poly-saccharides.

1 11. A method for improving the taste and aroma
2 subjectives comprising wrapping the tobacco charge in a
3 combustible cellulosic sheet containing a small amount, but
4 less than about 2%, of activated carbon having absorbed onto
5 the carbon a volatile flavorant.

1 12. The method defined in Claim 11, wherein the carbon
2 content is from about 0.1% to about 1.0%.

1 13. The method, as defined in Claim 12, wherein the
2 volatile flavorant is selected from the group consisting of
3 vanillin, ethyl vanillin, 3 methyl pentanoic acid, ethyl
4 valerate and isoamyl isovalerate.

1 14. The method, as defined in Claim 13, wherein the
2 volatile flavorant volatilizes from the carbon at temperatures
3 between about 50°C and 300°C.

1 15. The method, as defined in Claim 14, further
2 including 0.0% to 10% mono-, di-, tri-, or
3 poly-saccharides.

INTERNATIONAL SEARCH REPORT

PCT/US93/00075

A. CLASSIFICATION OF SUBJECT MATTER

IPC(5) : A24D 1/02

US CL : 131/365

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 131/365

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US,A, 5,131,416 (Gentry) 21 July 1992 See col. 7, lines 34-45.	1-15
A	US,A, 3,744,496 (McCarty et al.) 10 July 1973 See col. 2, lines 52-56.	1-15

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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Date of the actual completion of the international search

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Date of mailing of the international search report

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A wrapper for smoking article which, when wrapped about a tobacco column, provides improved mainstream smoke taste and sidestream smoke odor subjective. These objectives are attained by forming a cellulosic sheet containing a small amount, but less than about 2 %, of activated carbon having absorbed onto the carbon a volatile flavorant.

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accomplished by maintaining a sheet carbon content of less than 2% carbon (preferably 1% or below) with the carbon particle size being such to totally pass through a 200 mesh screen (ASTM E-11 test) and preferably totally 5 through a 325 mesh screen.

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	Magnesium Hydroxide Content:	0.0% to 35% Preferred 0.0% to 20%
25	Calcium Carbonate Content:	5.0% to 40% Preferred 10% to 30%
	Basis Weight:	20 gm/m ² to 100 gm/m ² Preferred 25 gm/m ² to 65 gm/m ²
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15		
	Burning Chemical Addition rate:	0.5% to 6.0%
20	Acid Addition:	0.0% to 10% organic or inorganic acid compatible with the alkali metal salt burning chemical
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10 prepared of regular type cigarette paper having the following properties: Basis weight of 25 gm/m² containing 25% low surface area calcium carbonate and 1% of the ethyl vanillin treated carbon as prepared above. The handsheets were dried duplicating paper machine drying
15 conditions and treated with a 2.0% solution of potassium citrate and redried again duplicating paper machine drying conditions. The resulting paper had a blue-white color and was cut into 27.5 mm x 65 mm strips. Filtered king-size cigarettes (20 mm filter, 65 mm tobacco column) were prepared, using the handsheet cigarette paper, prepared as described above, as the cigarette wrapper.
20 On smoking of the cigarette containing the ethyl vanillin treated carbon wrapper, a definite aroma of ethyl vanillin was observed in the sidestream smoke, and a
25 pleasant vanillin taste was present in the mainstream smoke. Appearance of the cigarette was totally

acceptable, having a normal grayish cast caused by the tobacco show-through of the paper.

Example II:

To 10 grams of GX 250 activated carbon from North America Carbon, Inc., was added 0.050 grams of 3 methyl pentanoic acid. The treated carbon was well mixed and allowed to stand overnight. Reduced sidestream smoke cigarette paper handsheets were then prepared having the following properties: Basis weight of 45 gm/M² containing 10 10% magnesium hydroxide prepared, as described in U.S. Patent 4,915,118, 30% Ecusta low surface area calcium carbonate and 0.5% of the above-treated carbon. The handsheets were dried, as in Example I, and then treated with a 6.5% solution of potassium citrate and 1% sulfuric acid and redried. The potassium citrate and 1% sulfuric acid and redried. The resulting paper had a blue-white to very light gray color and was cut into 27.5 mm x 65 mm strips. Filtered king-size cigarettes (20 mm filter, 65 mm tobacco column) were prepared, using the handsheet 15 reduced sidestream smoke cigarette paper, as described above, as the cigarette wrapper. On smoking of the cigarette containing the 3 methyl pentanoic acid treated carbon wrapper, a definite enhancement of tobacco taste was noted in the mainstream taste, and an enhancement of 20 the tobacco aroma was noted in the sidestream smoke. 25 Appearance of the cigarette was totally acceptable.

TABLE I (PART 1) - FLAVORANT TREATED CARBON

<u>Flavorant</u>	<u>Weight gm/M²</u>	<u>Type Carbon</u>	<u>% Carbon in Paper</u>	<u>% Carbon Treatment</u>	<u>Flavorant Treatment Per Cig. (Mg)</u>	<u>M^{2***}</u>
Ethyl Vanillin (a)	25	GX248 1	1.0	25	0.11	62.5
Ethyl Vanillin	25	GX248	2.0	25	0.22	125.0
Ethyl Vanillin	25	GX248	0.5	25	0.06	31.3
Ethyl Vanillin	45	GX248	1.0	25	0.20	112.5
Ethyl Vanillin	45	GX248	0.5	25	0.10	56.3
Ethyl Vanillin	45	GX248	0.25	25	0.05	28.1
Ethyl Vanillin	45	GX248	1.0	12.5	0.10	56.3
Ethyl Vanillin	45	GX250 2	1.0	12.5	0.10	56.3
Ethyl Vanillin	45	GX250	2.0	12.5	0.20	112.5
Ethyl Vanillin	45	GX186 3	1.0	12.5	0.10	56.3
Ethyl Vanillin	45	P100 4	1.0	12.5	0.10	56.3
Ethyl Vanillin	45	GX224 5	1.0	12.5	0.10	56.3

TABLE I - (PART 2) - FLAVORANT TREATED CARBON

<u>Flavorant</u>	<u>Comments</u>	<u>Paper Color</u>	<u>Cigarette Appearance</u>
Ethyl Vanillin (a)	Good EV taste/odor	Blue White	Acceptable
Ethyl Vanillin	strong EV taste/odor	Light Gray	Acceptable
Ethyl Vanillin	Low/detectable EV	Light Blue White	Acceptable
Ethyl Vanillin	strong EV taste/odor	Very Light Gray	Acceptable
Ethyl Vanillin	Good EV taste/odor	Blue White	Acceptable
Ethyl Vanillin	Low/detectable EV	Light Blue White	Acceptable
Ethyl Vanillin	Good EV taste/odor	Very Light Gray	Acceptable
Ethyl Vanillin	Good EV taste/odor	Very Light Gray	Acceptable
Ethyl Vanillin	strong EV taste/odor	Light Gray	Unacceptable
Ethyl Vanillin	Very low EV taste/odor	Black Specks	Unacceptable
Ethyl Vanillin	Good EV taste/odor	Very Small Black Specks	Unacceptable
Ethyl Vanillin	very low EV taste/odor	Small Black Specks	Unacceptable

TABLE I - (PART 3) - FLAVORANT TREATED CARBON

<u>Flavorant</u>	<u>Weight gm/M²</u>	<u>Type Carbon</u>	<u>% Carbon in Paper</u>	<u>% Carbon Treatment</u>	<u>Flavorant Treatment Per Cig. (Mg)</u>	<u>M²***</u>
3 MPA *	45	GX250	1.0	2.5	0.02	11.3
3 MPA	45	GX250	0.5	0.50	0.002	1.1
3 MPA	45	GX250	1.0	0.25	0.002	1.1
3 MPA	45	GX250	1.0	0.15	0.0012	0.7
3 MPA	45	GX250	1.0	0.05	0.0004	0.2
3 MPA	45	GX250	1.0	0.50	0.004	2.3
3 MPA	45	GX250	1.0	2.0	0.016	9.0
3 MPA	25	GX250	1.0	0.5	0.002	1.3
Chocolate **	45	GX250	1.0	10	0.08	45.0
IA-IV ***	45	GX250	1.0	10	0.08	45.0

TABLE I - (PART 4) - FLAVORANT TREATED CARBON

<u>Flavorant</u>	<u>Comments</u>	<u>Paper Color</u>	<u>Cigarette Appearance</u>
3 MPA *	Too strong, slightly bitter	Very Light Gray	Acceptable
3 MPA	Good enhanced tobacco taste	Very Light Gray	Acceptable
3 MPA	Good enhanced tobacco taste	Very Light Gray	Acceptable
3 MPA	Low enhanced tobacco taste	Very Light Gray	Acceptable
10	Minimal taste change	Very Light Gray	Acceptable
3 MPA	Strong enhanced tobacco taste	Very Light Gray	Acceptable
3 MPA	Too strong, slightly bitter	Very Light Gray	Acceptable
3 MPA	Good enhanced tobacco taste	Blue White	Acceptable
3 MPA	Good chocolate taste/aroma	Very Light Gray	Acceptable
IA-IV ***	Fruity aroma/taste	Very Light Gray	Acceptable

FOOTNOTES FOR TABLE I (PARTS 1 - 4)

- (a) Applied to carbon from a 50% ethyl alcohol solution
- * 3MPA = 3 Methyl pentanoic acid
- ** Chocolate = Firmenich Chocolate Flavor 587.593
- *** IA-IV = Isoamyl Isovalerate (Aldrich W20850-7)
- **** Cigarette Paper dimensions = 27.5 mm x 65 mm
- 1 GX248 Wood-based activated carbon from:
 North American Carbon, Inc.
 432 McCormick Boulevard
 Columbus, Ohio 43213-1585
 Particle Size ASTM E-11 = Greater than 98%
 thru 325 mesh
 CCl_4 activity - 110% minimum
- 2 GX250 Wood-based activated carbon from:
 North American Carbon, Inc.
 432 McCormick Boulevard
 Columbus Ohio 43213-1585
 Particle size ASTM E-11 = Greater than 99%
 thru 325 mesh
 CCl_4 activity - 110% minimum
- 3 GX186 Coconut shell-based activated carbon from:
 North American Carbon, Inc.
 432 McCormick Boulevard
 Columbus, Ohio 43213-1585
 Particle size ASTM E-11 = 2.2% on 50 mesh
 88.2% on 140 mesh
 9.6% thru 140 mesh
 CCl_4 activity - 60% minimum
- 4 P100 Wood-based activated carbon from:
 North American Carbon, Inc.
 432 McCormick Boulevard
 Columbus, Ohio 43213-1585
 Particle size ASTM E-11 = 8.4% on 200 mesh
 26.5% on 325 mesh
 73.5% thru 325 mesh
 CCl_4 activity - 110% minimum
- 5 GX224 Coconut shell-based activated carbon from:
 North American Carbon, Inc.
 432 McCormick Boulevard
 Columbus, Ohio 43213-1585
 Particle size ASTM E-11 = 10.1% on 80 mesh
 66.8% on 325 mesh
 23.1% thru 325 mesh
 CCl_4 activity - 60% minimum

CLAIMS

1 1. A wrapper for smoking articles, such as cigarettes,
2 cigars, and the like, comprising a cellulosic fiber sheet
3 containing a small amount, but less than about 2%, of
4 activated carbon having absorbed onto the carbon a volatile
5 flavorant.

1 2. The wrapper, as defined in Claim 1, wherein the
2 carbon content is from about 0.1% to about 1.0%.

1 3. The wrapper, as defined in Claim 2, wherein the
2 volatile flavorant is selected from the group consisting of
3 vanillin, ethyl vanillin, 3 methyl pentanoic acid, ethyl
4 valerate and isoamyl isovalerate.

1 4. The wrapper, as defined in Claim 2, wherein the
2 volatile flavorant volatilizes from the carbon at temperatures
3 between about 50°C and 300°C.

1 5. The wrapper, as defined in Claim 4, further
2 including 0.0% to 10% mono-, di-, tri-, or poly-saccharides.

1 6. A smoking article comprising a tobacco charge, such
2 as cigarettes, cigars, and the like, and a wrapper comprising
3 a cellulosic fiber sheet containing a small amount, but less
4 than about 2% of activated carbon having absorbed onto the
5 carbon a volatile flavorant.

1 7. The smoking article, as defined in Claim 6, wherein
2 the carbon content is from about 0.1% to about 1.0%.

1 8. The smoking article, as defined in Claim 7, wherein
2 the volatile flavorant is selected from the group consisting
3 of vanillin, ethyl vanillin, 3 methyl pentanoic acid, ethyl
4 valerate and isoamyl isovalerate.

1 9. The smoking article, as defined in Claim 7, wherein
2 the volatile flavorant volatilizes from the carbon at
3 temperatures between about 50°C and 300°C.

1 10. The smoking article, as defined in Claim 9, further
2 including 0.0% to 10% mono-, di-, tri-, or
3 poly-saccharides.

1 11. A method for improving the taste and aroma
2 subjectives comprising wrapping the tobacco charge in a
3 combustible cellulosic sheet containing a small amount, but
4 less than about 2%, of activated carbon having absorbed onto
5 the carbon a volatile flavorant.

1 12. The method defined in Claim 11, wherein the carbon
2 content is from about 0.1% to about 1.0%.

1 13. The method, as defined in Claim 12, wherein the
2 volatile flavorant is selected from the group consisting of
3 vanillin, ethyl vanillin, 3 methyl pentanoic acid, ethyl
4 valerate and isoamyl isovalerate.

1 14. The method, as defined in Claim 13, wherein the
2 volatile flavorant volatilizes from the carbon at temperatures
3 between about 50°C and 300°C.

1 15. The method, as defined in Claim 14, further
2 including 0.0% to 10% mono-, di-, tri-, or
3 poly-saccharides.

A. CLASSIFICATION OF SUBJECT MATTER

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US CL :131/365

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 131/365

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US,A, 5,131,416 (Gentry) 21 July 1992 See col. 7, lines 34-45.	1-15
A	US,A, 3,744,496 (McCarty et al.) 10 July 1973 See col. 2, lines 52-56.	1-15

Further documents are listed in the continuation of Box C.

See patent family annex.

•	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be part of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reasons (as specified)	"Z"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

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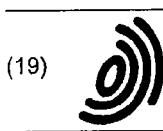
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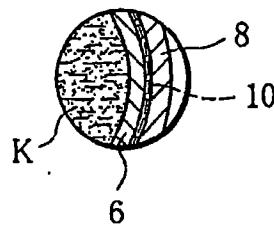
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**(54) DOUBLE WRAPPER CIGARETTE, AND MACHINE AND METHOD FOR
MANUFACTURING THE CIGARETTE**

(57) A double wrapper cigarette produced by a manufacturing machine and method according to the invention includes an inner wrapper (6) wrapped around a rod-like filler including a tobacco material, an outer

wrapper (8) surrounding the inner wrapper (6), and a perfume emitting layer (10) provided between the inner wrapper (6) and the outer wrapper (8). The perfume emitting layer (10) includes a perfume material for weakening odor of sidestream smoke of the cigarette.

FIG. 3



Description**TECHNICAL FIELD**

[0001] The invention relates to a double wrapper cigarette, more specifically, a double wrapper cigarette which can weaken odor of sidestream smoke, and a machine and method for manufacturing the cigarette.

BACKGROUND ART

[0002] When a cigarette is smoked, sidestream smoke tends to give an uncomfortable feeling to not only a smoker but also people around the smoker, which prevents the smoker from enjoying smoking.

[0003] Considering this, cigarettes reduced in sidestream smoke have been developed. Cigarettes of this type include special additives in their wrappers. The special additives are effective in reducing sidestream smoke but often strengthen the odor of the sidestream smoke compared with standard cigarettes.

[0004] It is thought that the odor of the sidestream smoke can be weakened by adding a perfume material to a cigarette. Specifically, a perfume material can be added to the filler of a cigarette or seam glue applied on a wrapper thereof.

[0005] However, when a perfume material is added to the filler, the perfume material damages the filler's original aroma and taste. When a perfume material is to be added to seam glue, it is difficult to add a sufficient amount of the perfume material to the seam glue without lowering the adhesive force of the seam glue.

DISCLOSURE OF THE INVENTION

[0006] An object of the invention is to provide a double wrapper cigarette which can satisfactorily weaken odor of sidestream smoke without the above-mentioned problems, and a method and machine for manufacturing the double wrapper cigarette.

[0007] A double wrapper cigarette which can achieve the above object comprises a rod-like filler including a tobacco material, an inner wrapper wrapped around the filler, an outer wrapper surrounding the inner wrapper, and a perfume emitting layer provided between the inner and outer wrappers, where the perfume emitting layer includes a perfume material for weakening odor of sidestream smoke.

[0008] When this double wrapper cigarette is smoked, the perfume emitting layer emits perfume, which weakens odor of sidestream smoke. Since the perfume emitting layer is provided between the inner and outer wrappers, the perfume does not penetrate into mainstream smoke. Hence, the filler's original aroma and taste is not damaged by the perfume. Further, since the perfume emitting layer can be formed in a large area between the inner and outer wrappers, it can include a sufficient amount of the perfume material to weaken the odor of

the sidestream smoke.

[0009] The inner and outer wrappers may include an additive for reducing sidestream smoke. In this case, when the double wrapper cigarette is smoked, the sidestream smoke produced therefrom is reduced.

[0010] Specifically, if the perfume material is soluble, the perfume emitting layer is formed by applying a perfume emitting liquid including the perfume material onto at least one of the inner and outer wrappers.

10 [0011] If the perfume material is insoluble, the perfume emitting layer may include glue for carrying the perfume material. It is favorable that the glue is polyvinyl acetate glue. In this case, it is desirable that the perfume material is in powder or grain form.

15 [0012] A machine for manufacturing this double wrapper cigarette comprises a first feeding path along which an inner web is fed; a second feeding path along which an outer web is fed; a wrapping section for continuously forming a tobacco rod by receiving the inner and outer webs from the first and second feeding paths, laying the inner web on the outer web to thereby form a double web, receiving a filler including a tobacco material on the double web, and wrapping the double web around the filler; a cutting section for cutting the tobacco rod

20 formed at the wrapping section into cigarette rods of a predetermined length; and at least one perfume material supply device provided along at least one of the first and second feeding paths, where the perfume material supply device is so provided as to apply material including a perfume onto the web on the at least one of the first and second feeding paths in the form of a layer, to thereby form a perfume emitting layer between the inner and outer webs for the double web.

25 [0013] In this manufacturing machine, a tobacco rod is formed by wrapping a filler in a double web including a perfume emitting layer, and then, a double wrapper cigarette is produced by cutting the tobacco rod.

[0014] If a soluble perfume material is used, the perfume material supply device may include a nozzle type applicator for applying a perfume emitting liquid including the perfume material onto the web.

[0015] If an insoluble perfume material is used, the perfume material supply device may include a glue applicator for applying glue onto the web to form an adhesive surface, and a diffuser for diffusing a perfume emitting material in powder or grain form over the adhesive surface of the web.

[0016] The diffuser may include a first brush roller rotatably located under the feeding path for the web, for blowing up the perfume emitting material toward the adhesive surface of the web, and a second brush roller rotatably located downstream of the first brush roller, for removing a surplus of the perfume emitting material attached to the adhesive surface.

50 [0017] In this blowing-up type diffuser, the amount of the perfume emitting material to be attached to the adhesive surface of the web can be controlled easily.

[0018] A method of manufacturing a double wrapper

cigarette comprises the steps of feeding an inner web and an outer web to a wrapping section of a cigarette manufacturing machine, and, at an inlet of the wrapping section, laying the inner web on the outer web to thereby form a double web; applying material including a perfume onto at least one of the inner and outer webs in the form of a layer while the inner and outer webs are being fed, to thereby form a perfume emitting layer between the inner and outer webs; supplying a filler including a tobacco material onto the double web at the inlet of the wrapping section; forming a tobacco rod continuously by wrapping the double web around the filler while the double web is passing through the wrapping section with the filler; and then cutting the tobacco rod into cigarette rods of a predetermined length.

[0019] In the above-described machine and method for manufacturing a double wrapper cigarette, a double wrapper cigarette can be easily manufactured by forming a perfume emitting layer on at least one of inner and outer webs while the inner and outer webs are being fed to the wrapping section.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

FIG. 1 is a prospective view of a filter cigarette which includes an embodiment of a double wrapper cigarette;

FIG. 2 is a cross-sectional view of the double wrapper cigarette of FIG. 1;

FIG. 3 is an enlarged view of part III of FIG. 2;

FIG. 4 is a schematic illustration showing a machine for manufacturing the double wrapper cigarette of FIG. 1;

FIG. 5 is a cross-sectional view showing an inner wrapper and an outer wrapper supplied to an inlet of a wrapping section of the manufacturing machine of FIG. 4;

FIG. 6 is a schematic illustration showing a manufacturing machine with a supply apparatus for supplying a perfume material in powder or grain form to a web, and

FIG. 7 is a schematic illustration showing another supply apparatus.

BEST MODE OF CARRYING OUT THE INVENTION

[0021] FIG. 1 shows a filter cigarette. The filter cigarette includes a double wrapper cigarette 2. A filter tip 4 is connected to an end of the double wrapper cigarette 2 by a tip paper piece 5.

[0022] The double wrapper cigarette 2 includes an inner wrapper 6 and an outer wrapper 8. The inner wrapper 6 is directly wrapped around filler K and forms the filler K into a rod-like shape. The outer wrapper 8 surrounds the inner wrapper 6 concentrically.

[0023] As seen from FIG. 2, the opposite side edges

of the outer wrapper 8 are overlapped and joined with seam glue (not shown), while the opposite side edges of the inner wrapper 6 are not overlapped. Hence, when developed, the inner wrapper 6 is smaller in width than the outer wrapper 8.

[0024] The filler K is a mixture of shredded tobacco obtained by shredding tobacco laminae and midribs thereof, shreds obtained by shredding reconstructed sheet tobacco, and expanded shredded tobacco.

[0025] The inner wrapper 6 and the outer wrapper 8 are both obtained by adding an additive for reducing sidestream smoke to flax pulp, wood pulp or other plant pulp. Here, as the additive, for example, calcium carbonate, a magnesium compound or the like is used. The inner wrapper 6 and the outer wrapper 8 may include a combustion conditioning agent such as a salt of an organic acid, and an ash conditioning agent such as phosphate. The basis weight of the inner and outer wrappers 6 and 8 is 10 to 100 g/m².

[0026] As shown in FIG. 3, the double wrapper cigarette 2 also includes a perfume emitting layer 10 between the inner wrapper 6 and the outer wrapper 8. The perfume emitting layer 10 covers the entire outer circumferential surface of the inner wrapper 6 or a part thereof. The perfume emitting layer 10 includes a perfume material.

When the double wrapper cigarette is smoked, the perfume material weakens odor of sidestream smoke produced at the combustion end of the double wrapper cigarette. Here, the perfume material is a substance chosen from among tempels, esters, alcohol such as linalool, nerol and geraniol, phenols such as anethol, aldehydes such as vanillin and ethyl vanillin, lactones, plant extract, fruit extract and the like, or a mixture of some of these substances.

[0027] FIG. 4 shows a manufacturing machine for the above-described double wrapper cigarette, which will be explained below.

[0028] A roll R₁ of inner web W₁ and a roll R₂ of outer web W₂ are provided in the manufacturing machine. The inner wrapper 6 is obtained from the inner web W₁, while the outer wrapper 8 is obtained from the outer web W₂. From the rolls R₁ and R₂ extend feeding paths 12 and 14, respectively. The feeding paths 12 and 14 are formed by a plurality of guide rollers, and have ends connected to an inlet of a wrapping section 16.

[0029] The feeding paths 12 and 14 each include a feed roller (not shown) and a reservoir 15. The feed rollers feed the inner web W₁ and the outer web W₂ from the roll R₁ and the roll R₂ along the feeding path 12 and the feeding path 14 to the wrapping section 16, respectively.

[0030] The wrapping section 16 includes an endless garniture tape 18. The garniture tape 18 is wound around a driving drum 20, and passes through a forming bed in the wrapping section 16, horizontally.

[0031] When the outer web W₂ and the inner web W₁ are fed to the wrapping section 16, the outer web W₂ and the inner web W₁ are laid on the garniture tape 18

on the forming bed 22 in the wrapping section 16 in this order, as shown in FIG. 5. Thus, the outer web W_2 and the inner web W_1 form a double web.

[0032] In this state, when the driving drum 20 is rotated, the garniture tape 18 travels with the double web in one direction. Thus, the double web passes through the forming bed 22 in the wrapping section 16 with the garniture tape 18. Specifically, the forming bed 22 has a forming groove (not shown) for guiding the garniture tape 18 and the double web. The width of the forming groove and the radius of curvature of the bottom of the forming groove decreases gradually from the inlet to the outlet of the wrapping section 16. At the outlet of the wrapping section 16, the forming groove has a nearly semicircular cross section.

[0033] At the inlet of the wrapping section 16, a layer of filler KL is fed onto the double web, or in other words, the inner web W_1 . Specifically, the layer of filler KL is formed by sucking and thereby holding filler in a layer on the under surface of an endless tobacco band 24. As the tobacco band 24 travels, the filler layer KL is transported to the inlet of the wrapping section 16. Then, at the inlet of the wrapping section 16, the filler layer KL is separated from the tobacco band 24 by a tongue shoe 26 and transferred onto the inner web W_1 .

[0034] Then, the filler layer KL passes through the tongue shoe 26, a short holder 28, a glue application nozzle 30 and a long holder 32 in the wrapping section 16, in this order, together with the double web. In this process, the filler layer KL is wrapped in the double web, so that a tobacco rod TR is formed continuously. The tobacco rod TR is transported downstream of the outlet of the wrapping section 16.

[0035] Specifically, the tongue shoe 26 compresses the filler layer KL from above to form the upper part of the filler layer KL into a semicircular cross section, while the forming groove of the forming bed 22 forms the double web into an U-like cross section, together with the help of the garniture tape 18. Thus, also the lower part of the filler layer KL is formed into a semicircular cross section. To sum up, the filler layer KL is compressed from above and below and formed into a circular cross section.

[0036] The short holder 28 bends one side edge portion of the double web, namely the inner and outer webs W_1 and W_2 into an arch shape with the help of the garniture tape 18, and puts the one side edge portion over a half of the upper part of the filler layer KL. The glue application nozzle 30 applies seam glue onto the other side edge of the double web, namely the outer web W_2 .

[0037] Then, the long holder 32 bends the other side edge portion of the double web into an arch shape with the help of the garniture tape 18 likewise, and puts the other side edge portion over the other half of the upper part of the filler layer KL. Thus, the other side edge of the outer web W_2 is placed on the one side edge thereof with the seam glue between, so that the both side edges of the outer web W_2 are glued together. As a result, a

tobacco rod TR is formed.

[0038] The tobacco rod TR transported from the wrapping section 16 has its seam glue dried while passing under a heater 34. Then, while the tobacco rod TR is passing through the cutting section 36, a rotary knife 38 in the cutting section 36 cuts the tobacco rod TR into pieces of a predetermined length. Thus, cigarette rods CR are formed. Here, the cigarette rod CR is twice as long as the double wrapper cigarette 2. Then, the cigarette rods CR are fed to a filter cigarette manufacturing machine (not shown) by a kicker 40.

[0039] After fed to the filter cigarette manufacturing machine, each cigarette rod CR is first cut into two double wrapper cigarettes 2, and a filter plug is placed between the two double wrapper cigarettes 2. Then, the two double wrapper cigarettes are connected with the filter plug by wrapping a tip paper piece around them. Thus, a double filter cigarette is formed. Then, the double filter cigarette is cut into two equal parts. As a result, filter cigarettes as shown in FIG. 1 are obtained.

[0040] The manufacturing machine of FIG. 4 further includes a nozzle-type applicator 42 along the feeding path 14 for the outer web W_2 . Specifically, the applicator 42 is located between the reservoir 15 and the wrapping section 16.

[0041] The applicator 42 applies a perfume emitting liquid onto one surface, namely the inner surface of the outer web W_2 . The area where the perfume emitting liquid is applied does not include the other side edge of the outer web W_2 to which the seam glue is applied. When the inner web W_1 is laid on the outer web W_2 with the perfume emitting liquid applied on at the inlet of the wrapping section 16, a layer 44 of the perfume emitting liquid is formed between the webs W_1 and W_2 as shown in FIG. 5.

[0042] The perfume emitting liquid is obtained by mixing the above-mentioned perfume material with EVA glue or PVAC glue as a carrier. EVA glue and PVAC glue are glues which are used as seam glue. Hence, the layer 44 functions also as an adhesive for joining the inner web W_1 and the outer web W_2 together.

[0043] As a carrier, PVAC glue is better in the capability of retaining the perfume material than EVA glue and CMC glue, and can emit the perfume into sidestream smoke better.

[0044] When the layer 44 is formed on the inner surface of the outer wrapper W_2 , the layer 44 functions as the perfume emitting layer 10 of the double wrapper cigarette 2.

[0045] The invention is not limited to the above-described embodiment. Various modifications can be made.

[0046] For example, the applicator 42 may form a layer 44 consisting of a plurality of streak-like parts, on the inner surface of the outer web W_2 .

[0047] If the applicator 42 is provided along the feeding path 12 as indicated by a chain double-dashed line in FIG. 4, the applicator 42 can form a layer 44 on a

surface of the inner web W_1 , namely the inner surface thereof which faces the outer web W_2 . In this case, the layer 44 may cover the entire inner surface of the inner web W_1 .

[0048] Applicators 42 may be provided along the feeding path 12 and along the feeding path 14, respectively. In this case, layers 44 are formed both on the inner wrapper W_1 and on the outer wrapper W_2 , respectively, which allows a larger amount of the perfume material to be retained between the inner and outer wrappers W_1 , W_2 .

[0049] In place of the nozzle type applicator 42, a roller type applicator may be used. The roller type applicator includes a transfer roller, which transfers a perfume emitting liquid to the inner web W_1 or the outer web W_2 and thereby forms a layer 44.

[0050] The manufacturing machine may have a supply device for supplying a perfume emitting material in powder or grain form. Specifically, as shown in FIG. 6, the supply device includes a glue applicator 46 and a diffuser 48 provided along the feeding path 14. The diffuser 48 is located downstream of the glue applicator 46. The glue applicator 46 applies PVAC glue onto the inner surface of the outer web W_2 and thereby makes the inner surface of the outer web W_2 an adhesive surface. Then, the diffuser 48 diffuses a perfume emitting material in powder or grain form over the adhesive surface of the outer web W_2 , so that the perfume emitting material is attached to the adhesive surface in the form of a layer.

[0051] As the perfume emitting material, dextrin powder perfume, curdlan powder, or powder perfume including β -cyclodextrin or the like as a carrier and any of the mentioned perfume materials can be used.

[0052] Also when the perfume emitting materials as mentioned above are used, a perfume emitting layer can be formed between the inner web W_1 and the outer web W_2 , and the double wrapper cigarette described above can be obtained.

[0053] As indicated by a chain double-dashed line in FIG. 6, the supply device may be provided along the feeding path 12. The supply devices may be provided along the feeding path 12 and along the feeding path 14, respectively.

[0054] In place of the above-described supply device, a supply device shown in FIG. 7 may be used.

[0055] The supply device of FIG. 7 includes at least one glue applicator 50 provided along the feeding path 12 and/or along the feeding path 14. The glue applicator 50 includes a glue pot and a transfer roller. The transfer roller of the glue applicator 50 applies PVAC glue stored in the glue pot onto a surface of a web and thereby makes it an adhesive surface.

[0056] The feeding path includes an upward slanting part downstream of the glue applicator 50, and a blowing-up type diffuser 52 is provided along this slanting part. The diffuser 52 has a housing 54 and a cover 56 which are arranged under and over the slanting part, re-

spectively, and extend along the slanting part. Specifically, the housing 54 is arranged under the feeding path and the top of the housing 54 is partly open. The cover 56 covers the top of the housing 54, and a web travels between the housing 54 and the cover 56.

[0057] A perfume emitting material in powder or grain form is stored in the housing 54, and two brush rollers 58 and 60 are rotatably arranged inside the housing 54. The brush rollers 58, 60 are apart from each other in the direction in which the web travels, and only the brush roller 58 is partly buried in the perfume emitting material.

[0058] As the brush rollers 58 and 60 rotate, the brush roller located upstream, namely the lower brush roller 58 blows up the perfume emitting material stored in the housing 54 toward the web, so that the perfume emitting material is attached to the adhesive surface of the web in the form of a layer. Then, the brush roller located downstream, namely the upper brush roller 60 removes a surplus of the perfume emitting material from the adhesive surface of the web. Hence, a desired amount of the perfume emitting material is attached to the web.

Claims

25. 1. A double wrapper cigarette, comprising:
a rod-like filler including a tobacco material,
an inner wrapper wrapped around said filler,
an outer wrapper surrounding said inner wrapper, and
a perfume emitting layer provided between said inner wrapper and said outer wrapper,
said perfume emitting layer including a perfume material for weakening odor of sidestream smoke of the cigarette.
30. 2. The double wrapper cigarette according to claim 1,
wherein
said inner wrapper and said outer wrapper include an additive for reducing the sidestream smoke.
35. 3. The double wrapper cigarette according to claim 1,
wherein
said perfume emitting layer further includes glue for carrying the perfume material.
40. 4. The double wrapper cigarette according to claim 3,
wherein the glue is polyvinyl acetate glue.
45. 5. The double wrapper cigarette according to claim 3,
wherein the perfume material is in powder form or in grain form.
50. 6. A manufacturing machine for manufacturing a double wrapper cigarette, comprising:

- a first feeding path along which an inner web is fed,
 a second feeding path along which an outer web is fed,
 a wrapping section for continuously forming a tobacco rod by receiving the inner and outer webs from said first and second feeding paths, laying the inner web on the outer web to thereby form a double web, receiving a filler including a tobacco material on the double web, and wrapping the double web around the filler, 5
 a cutting section for cutting the tobacco rod formed at said wrapping section into pieces of a predetermined length, and
 at least one perfume material supply device located along one of said first and second feeding paths, 10
 said perfume material supply device being so provided as to apply material including a perfume onto at least one of the inner and outer webs fed along said first and second feeding paths in the form of a layer, to thereby form a perfume emitting layer between the inner and outer webs of the double web, 15
 20
 25
7. The manufacturing machine according to claim 6, wherein
 said perfume material supply device includes a nozzle type applicator for applying a perfume emitting liquid including the perfume material onto the inner web or the outer web. 30
8. The manufacturing machine according to claim 6, wherein
 said perfume material supply device includes 35
 a glue applicator for applying glue onto the inner web or the outer web to thereby make an adhesive surface, and
 a diffuser for diffusing a perfume emitting material in powder or grain form over the adhesive surface of the inner web or the outer web. 40
9. The manufacturing machine according to claim 8, wherein
 said diffuser includes 45
 a first brush roller rotatably located under said feeding path, for blowing up the perfume emitting material toward said adhesive surface of the inner web or the outer web, and
 a second brush roller rotatably located downstream of said first brush roller, for removing a surplus of the perfume emitting material attached to the adhesive surface. 50
10. A method of manufacturing a double wrapper cigarette, comprising the steps of: 55
 feeding an inner web and an outer web to a
- wrapping section of a cigarette manufacturing machine, and, at an inlet of the wrapping section, laying the inner web on the outer web to thereby form a double web,
 applying material including a perfume material onto at least one of the inner and outer webs in the form of a layer while the inner and outer webs are being fed, to thereby form a perfume emitting layer between the inner and outer webs of the double web,
 supplying a filler including a tobacco material onto the double web at the inlet of the wrapping section,
 forming a tobacco rod continuously by wrapping the double web around the filler while the double web is passing through the wrapping section together with the filler, and
 cutting the tobacco rod into pieces of a predetermined length. 60

FIG. 1

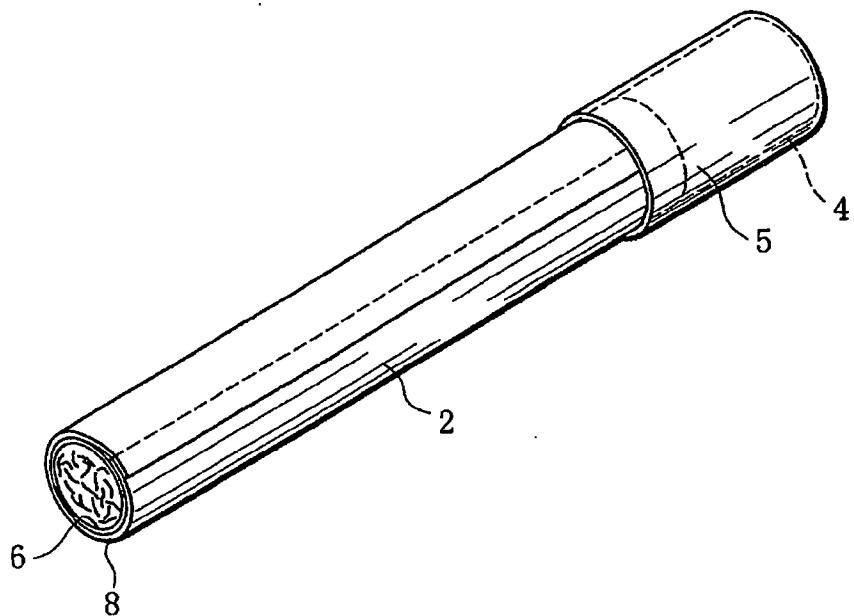


FIG. 2

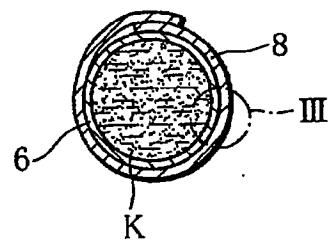


FIG. 3

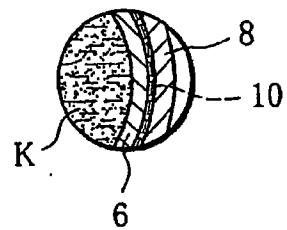


FIG. 4

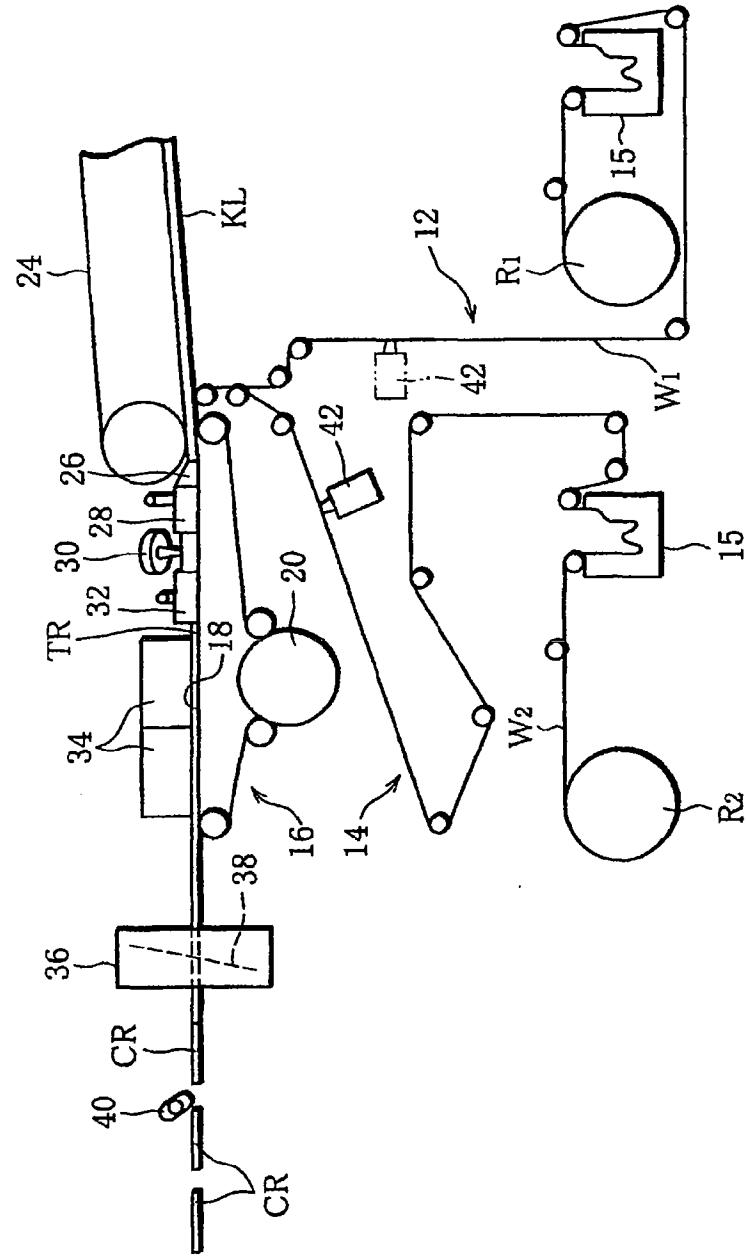


FIG. 5

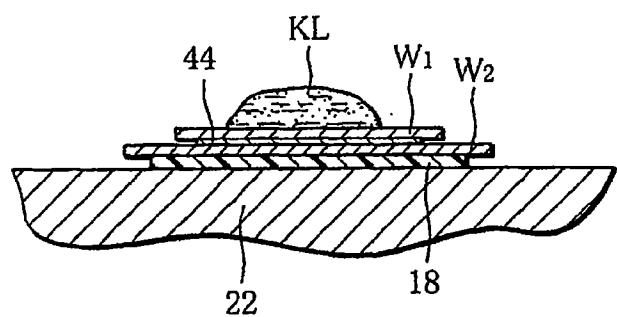


FIG. 6

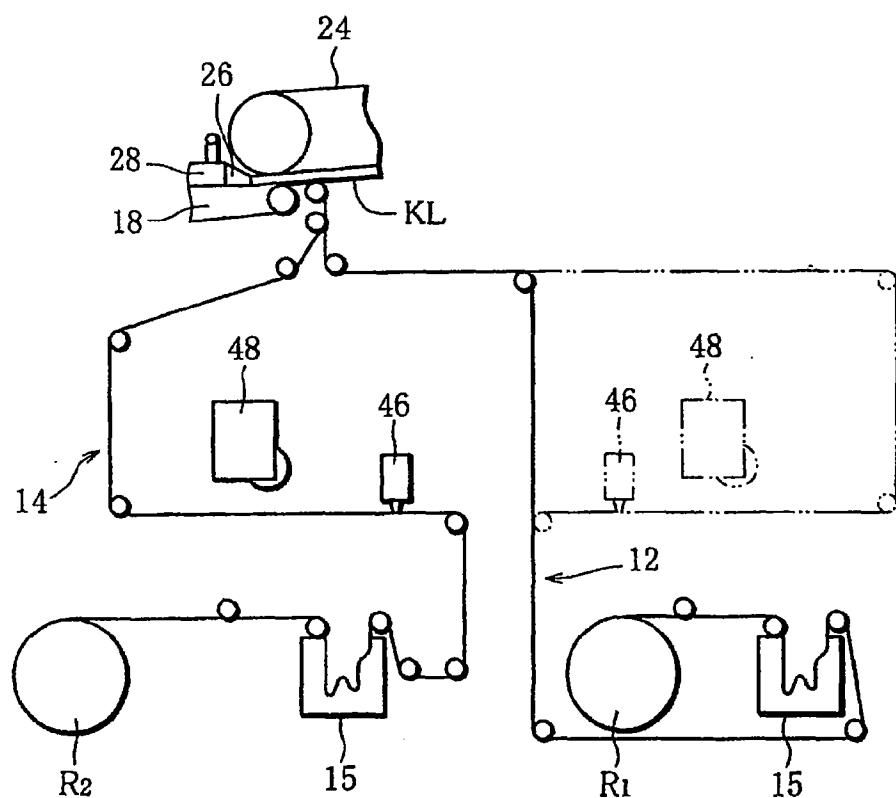
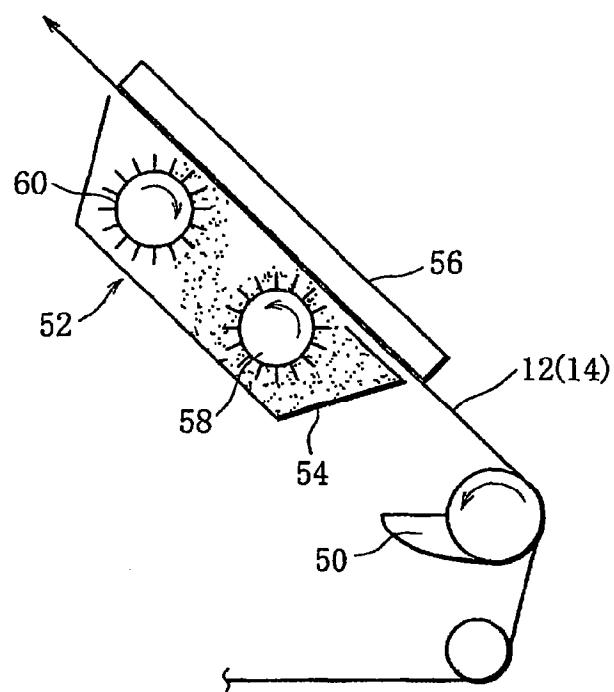


FIG. 7

WRAPPING SECTION



INTERNATIONAL SEARCH REPORT		International application No. PCT/JP02/07463															
A. CLASSIFICATION OF SUBJECT MATTER Int.Cl ⁷ A24C5/46																	
According to International Patent Classification (IPC) or to both national classification and IPC																	
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) Int.Cl ⁷ A24C5/46																	
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1926-1996 Toroku Jitsuyo Shinan Koho 1994-2002 Kokai Jitsuyo Shinan Koho 1971-1996 Jitsuyo Shinan Toroku Koho 1996-2002																	
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)																	
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 2px;">Category*</th> <th style="text-align: left; padding: 2px;">Citation of document, with indication, where appropriate, of the relevant passages</th> <th style="text-align: left; padding: 2px;">Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">WO 99/35923 A1 (Japan Tobacco Inc.),</td> <td style="padding: 2px;">1-5</td> </tr> <tr> <td style="padding: 2px;">A</td> <td style="padding: 2px;">22 July, 1999 (22.07.99), & EP 1050223 A1 & JP 11-266851 A & AU 1891499 A & CN 1288356 T & TW 387799 B</td> <td style="padding: 2px;">6-10</td> </tr> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">US 5709228 A (Rothmans, Benson & Hedges, Inc.),</td> <td style="padding: 2px;">1-5</td> </tr> <tr> <td style="padding: 2px;">A</td> <td style="padding: 2px;">20 January, 1998 (20.01.98), & DE 69007791 C & AU 639239 B & JP 4-501805 A & EP 474706 A & ZA 9004220 A & WO 90/14776 A & CA 2054745 A & GB 8912688 A & AU 5733990 A & GB 8917089 A & GB 8914267 A</td> <td style="padding: 2px;">6-10</td> </tr> </tbody> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	WO 99/35923 A1 (Japan Tobacco Inc.),	1-5	A	22 July, 1999 (22.07.99), & EP 1050223 A1 & JP 11-266851 A & AU 1891499 A & CN 1288356 T & TW 387799 B	6-10	Y	US 5709228 A (Rothmans, Benson & Hedges, Inc.),	1-5	A	20 January, 1998 (20.01.98), & DE 69007791 C & AU 639239 B & JP 4-501805 A & EP 474706 A & ZA 9004220 A & WO 90/14776 A & CA 2054745 A & GB 8912688 A & AU 5733990 A & GB 8917089 A & GB 8914267 A	6-10
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		<input type="checkbox"/> See patent family annex.															
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed																	
Date of the actual completion of the international search 28 August, 2002 (28.08.02)		Date of mailing of the international search report 10 September, 2002 (10.09.02)															
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer															
Facsimile No.		Telephone No.															

INTERNATIONAL SEARCH REPORT		International application No. PCT/JP02/07463
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 11-178562 A (Japan Tobacco Inc.),	1-5
A	06 July, 1999 (06.07.99), (Family: none)	6-10
Y	JP 2000-96493 A (Japan Tobacco Inc.),	1-5
A	04 April, 2000 (04.04.00), & JP 2938067 B	6-10
Y	US 5979461 A (Philip Morris Inc.), 09 November, 1999 (09.11.99), (Family: none)	2
A	US 5462073 A (Rothmans, Benson & Hedges, Inc.), 31 October, 1995 (31.10.95), & US 5699812 A1 & JP 6-220800 A & DE 69229570 T & AU 644927 B & ZA 9200049 A & CA 2057962 A & GB 9100196 A & AU 1001292 A & EP 495567 A3 & GB 9114598 A & GB 9110559 A & GB 9108783 A & GB 9103202 A	1-10
A	EP 559300 A3 (Philip Morris Products Inc.), 06 February, 1990 (06.02.90), & US 4998542 A1 & EP 386884 A2 & AU 5001890 A & FI 900903 A & HU 56256 A & IL 93261 D & CA 2010575 A & NO 900837 A & NO 931828 A & PT 93230 A & CN 1045020 A & JP 2-243000 A & ZA 9000902 A & BR 9000856 A & PL 283926 A & TR 24329 A & NZ 232308 A & AU 623977 B & YU 24890 A & SU 1804312 A	1-10



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⑪ Publication number : **0 533 423 A1**

⑫

EUROPEAN PATENT APPLICATION

⑬ Application number : **92308354.7**

⑮ Int. Cl.⁵ : **A24D 1/02**

⑭ Date of filing : **14.09.92**

⑯ Priority : **19.09.91 GB 9120060**

⑰ Date of publication of application :
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⑲ Designated Contracting States :
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⑷ A rod of smoking material and cigarettes made therefrom.

⑷ A rod of smoking material having an inner wrapper of sidestream reducing paper containing carbon as part of its total filler content and an outer overwrapping cigarette paper.

EP 0 533 423 A1

This invention relates to a rod of smoking material and a cigarette produced therefrom that gives reduced levels of sidestream smoke whilst maintaining acceptable smoke taste, puff number and tactile characteristics.

According to the present invention a rod of smoking material has an inner wrapper of sidestream reducing paper containing carbon as part of its total filler content and an outer overwrapping cigarette paper.

5 The outer wrapping can be a conventional cigarette paper or a low sidestream cigarette paper made and supplied by, for example Ecusta (a Division of P.H. Glatfelter Co.), Papeteries de Mauduit, or Kimberly-Clark Corporation.

The inner and outer wrappers can be of different porosity and it has been found that unexpected results for the burn rates of cigarettes with this type of construction can be obtained.

10 For example, use of a carbon-filled paper with a porosity of 12 CORESTA gave a static burn rate of 4mm/min but when overwrapped with a paper of porosity 120 CORESTA a burn rate of 5.2 mm/min was obtained. This resulted in a cigarette having two less puffs than the cigarette which has the carbon filled paper, in addition the overwrapped cigarette gave rise to greater sidestream reduction (53%) relative to the cigarette with just the carbon paper (30%).

15 The tobacco rod can be attached to a filter element and the invention also includes a cigarette incorporating such a smoking material rod.

The cigarette rod and a cigarette incorporating the rod can be made in various ways and the accompanying drawing is a cross-section view through a cigarette incorporating the invention.

20 As shown in the drawing the cigarette comprises a rod of smoking material, for example, tobacco 1 which is located within an inner wrapper 2 made from a sidestream reducing paper containing carbon. The inner wrapper is enclosed within an overwrapping outer wrapper 3 made from a conventional cigarette paper or from a low sidestream cigarette paper. A conventional filter element 4 made from, for example, cellulose acetate, polypropylene, paper or web materials is attached to the cigarette rod by a tipping paper 5.

A range of cigarette design parameters relating to cigarettes incorporating the invention are set out below.

25 RANGE OF CIGARETTE PARAMETERS			
	PARAMETER	RANGE	PREFERRED VALUES
30	Cigarette length (mm)	50 - 140	60 - 100
	Tobacco rod length (mm)	40 - 100	50 - 90
	Filter length (mm)	5 - 40	10 - 30
35	Tobacco rod circumference (mm)	10 - 30	17 - 25
	Tobacco rod density (mg/cc)	120 - 300	180 - 275
	Inner paper porosity (CORESTA units)	4 - 130	10 - 30
40	Outer paper porosity (CORESTA units)	4 - 300	20 - 300

Cigarette paper parameters for the invention are also shown as follows.

45 PAPER SPECIFICATION		
PARAMETER INNER PAPER	RANGE	PREFERRED VALUES
Basis Weight g/m ²	20 - 60	35 - 50
% Carbon in filler	5 - 20	8 - 15
% Mg(OH) ₂ in filler	5 - 20	6 - 11
% CaCO ₃ in filler	5 - 20	15 - 20
Porosity (CORESTA units)	4 - 130	5 - 20

55 Although the invention is not limited to the particular parameters set out above they provide sufficient details to make cigarettes according to the invention.

Inner wrapper
Same Length
Quantity
Wrapper
→ application
of filter paper

If desired the outer wrapper can be impregnated with or incorporate flavour components to improve the flavour of mainstream smoke and the aroma of sidestream smoke. Alternatively this can be achieved, for example, by impregnating the carbon portion of the filler material in the paper or by incorporating a flavour component in the filler materials.

5 Additionally, irritant reducing and impact enhancing compounds can be added to the filler.

Carbon used in the filler can have a range of surface areas and activities. Typically the surface areas of the carbon used can be in the range of 200 to 2000 m²g⁻¹ with activities (measured by the Carbon Tetrachloride method of absorption) in the range of 20 to 150%.

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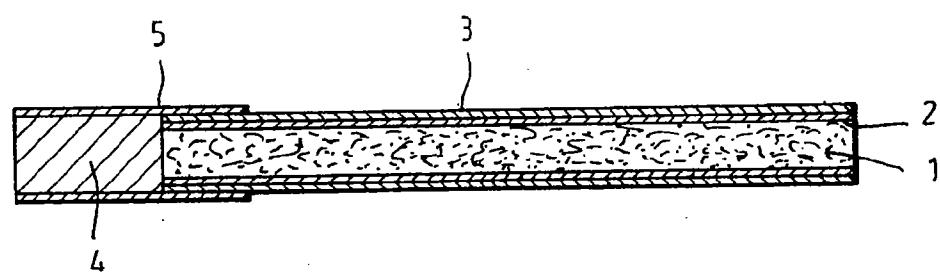
Claims

1. A rod of smoking material having an inner wrapper of sidestream reducing paper containing carbon as part of its total filler content and an outer overwrapping cigarette paper.
- 15 2. A rod of smoking material as claimed in claim 1 in which the outer wrapping is a conventional cigarette paper or a low sidestream cigarette paper.
3. A rod of smoking material as claimed in claim 2 in which the inner wrapper and outer wrapping are of different porosity.
- 20 4. A rod of smoking material as claimed in claims 1 to 3 in which the outer overwrapping is impregnated with or incorporates a flavour component.
5. A rod of smoking material as claimed in claims 1 to 4 in which the carbon portion of the filler is impregnated with a flavour component.
- 25 6. A rod of smoking material as claimed in claims 1 to 4 in which the filler material incorporates a flavour component.
7. A rod of smoking material as claimed in claims 1 to 6 in which an irritant reducing compound is added to the filler.
- 30 8. A rod of smoking material as claimed in claims 1 to 7 in which an impact enhancing compound is added to the filler.
9. A rod of smoking material as claimed in claims 1 to 8 in which the surface area of the carbon used in the filler is in the range of 200 to 2000 m²g⁻¹ with activities (measured by the Carbon Tetrachloride method of absorption) in the range of 20% to 150%.
- 35 10. A rod of smoking material as claimed in claims 1 to 9 which is attached to a filter element.
11. A cigarette incorporating a rod of smoking material as set forth in any one of the preceding claims.

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European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 30 8354

DOCUMENTS CONSIDERED TO BE RELEVANT															
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)												
X	FR-A-2 163 008 (OLIN CORPORATION) * page 3, line 20 - page 5, line 35; examples 1,2 *	1-3,5,11	A24D1/02												
X	US-A-4 505 282 (COGBILL) --- * the whole document *	1,2,5,6, 11													
A	---	9													
A	US-A-4 225 636 (CLINE) * the whole document *	1,2													

			TECHNICAL FIELDS SEARCHED (Int. Cl.5)												
			A24D D21H												
<p>The present search report has been drawn up for all claims</p> <table border="1"> <tr> <td>Place of search THE HAGUE</td> <td>Date of completion of the search 07 DECEMBER 1992</td> <td>Examiner RIEGEL R.E.</td> </tr> <tr> <td colspan="3">CATEGORY OF CITED DOCUMENTS</td> </tr> <tr> <td colspan="3"> X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document </td> </tr> <tr> <td colspan="3"> T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document </td> </tr> </table>				Place of search THE HAGUE	Date of completion of the search 07 DECEMBER 1992	Examiner RIEGEL R.E.	CATEGORY OF CITED DOCUMENTS			X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		
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2003年2月20日 (20.02.2003)

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A24C 5/46

(74) 代理人: 長門 侃二 (NAGATO,Kanji); 〒105-0004 東京都 港区 新橋5丁目8番1号 S K Kビル5階 Tokyo (JP).

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(71) 出願人(米国を除く全ての指定国について): 日本たばこ産業株式会社 (JAPAN TOBACCO INC.) [JP/JP]; 〒105-8422 東京都港区虎ノ門二丁目2番1号 Tokyo (JP).

添付公開書類:
— 國際調査報告書

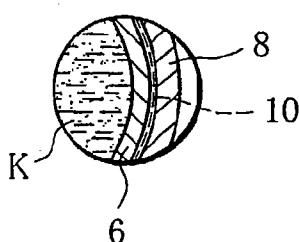
(72) 発明者; および

(75) 発明者/出願人(米国についてのみ): 田淵 洋己 (TABUCHI,Hironori) [JP/JP]; 〒130-8603 東京都 墨田区横川一丁目 17番7号 日本たばこ産業株式会社内 Tokyo (JP). 深町 征臣 (FUKAMACHI,Masaomi) [JP/JP]; 〒130-8603 東京都 墨田区横川一丁目 17番7号 日本たばこ産業株式会社内 Tokyo (JP). 奥山 英利 (OKUYAMA,Hidetoshi) [JP/JP]; 〒130-8603 東京都 墨田区横川一丁目 17番7号 日本たばこ産業株式会社内 Tokyo (JP).

(84) 指定国(広域): ARIPO 特許 (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア特許 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ特許 (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI 特許 (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(54) Title: DOUBLE WRAPPER CIGARETTE, AND MACHINE AND METHOD FOR MANUFACTURING THE CIGARETTE

(54) 発明の名称: ダブルラッパーシガレット、その製造機及び製造方法



(57) Abstract: A double wrapper cigarette, and a machine and a method for manufacturing the cigarette, the double wrapper cigarette comprising an inner wrapper (6) wrapping a rod-shaped filler formed with smoking material, an outer wrapper (8) surrounding the inner wrapper (6), and an aroma producing layer (10) installed between the inner wrapper (6) and the outer wrapper (8), the aroma producing layer (10) further comprising aroma for reducing the odor of auxiliary flowing smoke.

(57) 要約:

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本発明の製造機及び製造方法により製造されるダブルラッパーシガレットは、
喫煙材料からなるロッド状の充填材を包み込むインナラッパー(6)と、このイ
ンナラッパー(6)を囲むアウタラッパー(8)と、インナラッパー(6)とア
ウタラッパー(8)との間に設けられた香気発生層(10)とを含み、香気発生
層(10)は、副流煙の臭気を緩和するための香料を有する。

明 紹 書

ダブルラッパーシガレット、その製造機及び製造方法

技術分野

5 本発明はダブルラッパーシガレットに係わり、より詳しくは、副流煙の臭気を改善するダブルラッパーシガレット、その製造機及び製造方法に関する。

背景技術

シガレットの喫煙時、副流煙は喫煙者のみならず、その周囲の人々にも不快感を与えることがあり、喫煙者は快く喫煙することができない。

このような事情から副流煙を低減したシガレットが開発され、この種のシガレットのラッパーには特殊の添加剤が含まれている。特殊な添加剤は副流煙の低減には有効であるものの、副流煙の臭気を通常のシガレットにおける副流煙の臭気よりも強くしてしまうことが多い。

15 副流煙の臭気は、シガレット内に香料を付加することで緩和されるものと考えられる。具体的には、香料は、シガレットの充填材やラッパーのシーム糊に付加することができる。

しかしながら、香料が充填材に付加されると、充填材本来の香りや風味が損なわれる。一方、香料がシーム糊に付加される場合、シーム糊の接着力を低下させることなく、シーム糊に十分な量の香料を付加することは困難である。

発明の開示

本発明の目的は、上述の不具合を被ることなく、副流煙の臭気を好適に緩和することができるダブルラッパーシガレット、その製造方法および製造機を提供することにある。

上述の目的を達成するダブルラッパーシガレットは、喫煙材料からなるロッド

状の充填材と、この充填材を包み込むインナラッパーと、このインナラッパーを囲むアウタラッパーと、インナラッパーとアウタラッパーとの間に設けられた香料発生層とを備え、この香料発生層は、副流煙の臭気を緩和するための香料を含む。

5 上述のダブルラッパーシガレットによれば、喫煙時、香料発生層は香気を解放し、この香気は副流煙の臭気を緩和する。香料発生層は、インナラッパーとアウタラッパーと間にがあるので、香気が主流煙に侵入することはない。それ故、充填材本来の風味や味覚が香気により阻害されることはない。また、香気発生層はインナラッパーとアウタラッパーとの間の広い領域に形成可能であるから、副流煙
10 の臭気を緩和するうえで、十分な量の香料を含むことができる。

インナラッパー及びアウタラッパーは、副流煙を低減するための充填剤を含むことができる。この場合、喫煙時、ダブルラッパーシガレットから発生する副流煙は低減される。

具体的には、香料が溶解性を有していれば、香気発生層は、インナラッパー又
15 はアウタラッパーの少なくとも一方に香料を含む香気発生液を塗布することで形成される。

しかしながら、香料が溶解性を有していなければ、香料発生層は香料を担持する糊を含むことができ、糊はポリビニールアセテート糊であるのが好ましい。この場合、香料は粉状又は粒状であるのが望ましい。

20 上述したダブルラッパーシガレットの製造機は、インナウエブを送出する第1送出経路と、アウタウエブを送出する第2送出経路と、第1及び第2送出経路からインナウエブ及びアウタウエブをそれぞれ受け取って、インナウエブ及びアウタウエブを互いに重ね合わせたダブルウエブを形成する一方、ダブルウエブ上に喫煙材料からなる充填材の供給を受け、充填材をダブルウエブにより包み込んで、たばこロッドを連続的に成形するラッピングセクションと、ラッピングセクションにて成形されたたばこロッドを所定の長さ毎に切断する切断セクションと、第
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1 及び第2送出経路の少なくとも一方に設けられた香料供給装置とを備えており、香料供給装置は、一方の送出経路のウエブに香料を含んだ材料を層状に付着させ、ダブルウエブのインナウエブとアウタウエブとの間に香気発生層を形成する。

上述の製造機によれば、充填材が香気発生層を有するダブルウエブにより包み
5 込まれることでたばこロッドが成形され、この後、たばこロッドを切断することにより、ダブルラッパーシガレットが製造される。

香料が溶解性を有していれば、香料供給装置は、ウエブに香料を含んだ香気発生液を塗布するノズル型塗布器を含むことができる。

これに対し、香料が溶解性を有していないければ、香料供給装置は、ウエブに糊
10 を塗布して、接着面を形成する糊塗布器と、ウエブの接着面に粉状又は粒状の香気発生材料を散布する散布器とを含むことができる。

更に、散布器は、送出経路の下方に回転可能に配置され、ウエブの接着面に向
けて香気発生材料を吹き上げる第1ブラシローラと、第1ブラシローラの下流に
回転可能に配置され、接着面に付着した余剰の香気発生材料を搔き落とす第2ブ
15 ラシローラとを有することができる。

上述した吹き上げ型の散布器によれば、ウエブの接着面への香気発生材料の付
着量を容易に制御することができる。

更に、ダブルラッパーシガレットの製造方法は、シガレット製造機のラッピングセクションに向けてインナウエブ及びアウタウエブをそれぞれ供給して、ラッピングセクションの入口にてインナウエブ及びアウタウエブが互いに重なり合ったダブルウエブを形成する工程と、インナウエブ及びアウタウエブの供給過程にて、インナウエブ及びアウタウエブの少なくとも一方に香料を含んだ材料を層状に付着させ、ダブルウエブのインナウエブとアウタウエブとの間に香気発生層を形成する工程と、ラッピングセクションの入口にてダブルウエブに喫煙材料からなる充填材を供給する工程と、ダブルウエブが充填材とともにラッピングセクションを通過する際、ダブルウエブにより充填材を包み込み、たばこロッドを連続

して形成する工程と、この後、たばこロッドを所定長さ毎に切断する工程とを含む。

上述したダブルラッパーシガレットの製造機及び製造方法によれば、ラッピングセクションに向けてインナーウエブ及びアウターウエブが供給されるとき、これら 5 インナーウエブ及びアウターウエブの少なくとも一方に香気発生層を形成するだけで、ダブルラッパーシガレットを簡単に製造することができる。

図面の簡単な説明

第1図は、一実施例のダブルラッパーシガレットを有するフィルタシガレット 10 の斜視図、

第2図は、第1図のダブルラッパーシガレットの横断面図、

第3図は、第2図中 III 部の拡大図、

第4図は、第1図のダブルラッパーシガレットを製造するための製造機の概略図、

15 第5図は、第4図の製造機におけるラッピングセクションの入口に供給されたインナラッパー及びアウタラッパーを示す横断面図である。

第6図は、一方のウエブに粉状又は粒状の香料を供給する供給器を備えた製造機の概略図、及び

第7図は、他の供給装置を示す概略図である。

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発明を実施するための最良の形態

第1図はフィルタシガレットを示す。このフィルタシガレットはダブルラッパーシガレット2を有し、ダブルラッパーシガレット2の一端にはフィルタチップ4がチップペーパ片5を介して接続されている。

25 ダブルラッパーシガレット2はインナラッパー6及びアウタラッパー8を有し、インナラッパー6は充填材Kを直接に包み込み、充填剤Kをロッド状に成形する。

一方、アウタラッパー8はインナラッパー6を外側から同心的に囲んでいる。

第2図から明かなように、アウタラッパー8の両側縁は互いに重ね合わされ、そして、シーム糊（図示しない）により接着されている。しかしながら、インナラッパー6の両側縁は重なり合っていない。即ち、展開してみたとき、インナラッパー6の幅はアウタラッパー8の幅よりも狭い。

充填材Kは、タバコラミナや中骨を裁刻して得られる刻みたばこ、再生シートたばこを裁刻して得られる再生刻みたばこ、膨化処理された刻みたばこの混合物である。

インナラッパー6及びアウタラッパー8は共に、亜麻パルプ、木材パルプ又は他の草木の植物パルプに、副流煙を低減するための充填剤を付加して得られる。

ここで、充填剤には例えば炭酸カルシウムやマグネシウム化合物等が使用される。更に、インナラッパー6及びアウタラッパー8は有機酸塩等の燃焼調節剤や、リン酸塩等の灰調節剤をも含むことができる。インナ及びアウタラッパー6、8の坪量は10～100g/m²である。

第3図に示されるようにダブルラッパーシガレット2は香気発生層10を更に含み、この香気発生層10はインナラッパー6とアウタラッパー8との間に配置されている。香気発生層10はインナラッパー6の外周面全域又はその一部に塗布されている。香気発生層10は香料を含有し、この香料は、喫煙時、ダブルラッパーシガレットの燃焼端から発生する副流煙の臭気を緩和する。具体的には、ここでの香料は、テンペル類、エステル類、リナロール、ネロールやゲラニオール等のアルコール類、アнетール等のフェノール類、バニリンやエチルバニリン等のアルデヒド類、ラクトン類、植物及び果実抽出物等の何れか、又は、これらの混合物である。

第4図は上述したダブルラッパーシガレットのための製造機を示し、この製造機について以下に説明する。

製造機は、インナウエブW₁のロールR₁及びアウタウエブW₂のロールR₂をそ

それぞれ備える。インナラッパー6はインナウエブW₁から得られ、アウタラッパー8はアウタウエブW₂から得られる。ロールR₁, R₂からは送出経路12, 14がそれぞれ延びている。これら送出経路12, 14は複数のガイドローラから規定され、ラッピングセクション16の入口に連なる終端を有する。

5 送出経路12, 14の途中にはフィードローラ(図示しない)やリザーバ15がそれぞれ介挿されており、フィードローラはロールR₁, R₂からインナウエブW₁及びアウタウエブW₂を送出経路12, 14に沿い、ラッピングセクション16に向けて供給する。

10 ラッピングセクション16は無端状のガニチャテープ18を有し、このガニチャテープ18はラッピングセクション16の成形ベッドを水平に通過する部分と、駆動ドラム20に掛け回された部分とを有する

15 アウタウエブW₂及びインナウエブW₁がラッピングセクション16に導かれると、第5図に示されるように、アウタウエブW₂及びインナウエブW₁はラッピングセクション16の成形ベッド22上にて、ガニチャテープ18に順次重ね合わされ、これにより、ダブルウエブが形成される。

20 このような状態にて、駆動ドラム20が回転されると、ガニチャテープ18はダブルウエブとともに一方向に走行する。即ち、ダブルウエブはガニチャテープ18とともにラッピングセクション16の成形ベッド22を通過する。より詳しくは、成形ベッド22はガニチャテープ18及びダブルウエブの走行を案内する成形溝(図示しない)を有する。この成形溝の幅や底の曲率半径は、ラッピングセクション16の入口から出口に向けて徐々に減少し、ラッピングセクション16の出口にて、成形溝はほぼ半円の断面形状を有する。

一方、ラッピングセクション16の入口にて、ダブルウエブ、即ち、インナウエブW₁上に充填材層KLが供給される。より詳しくは、充填材層KLは無端状のたばこバンド24の下面に充填材を層状に吸着して形成される。充填材層KLはたばこバンド24の走行に伴い、ラッピングセクション16の入口に向けて移

送され、そして、ラッピングセクション16の入口にて、トングシュー26によりたばこバンド24から剥離されてインナウエブW₁上に乗り移る。

この後、充填材層KLはダブルウエブとともにラッピングセクション16のトングシュー26、ショートホルダ28、糊塗布ノズル30及びロッドホルダ32を順次通過する。この過程にて、充填材層KLはダブルウエブに包み込まれ、この結果、たばこロッドTRが連続して成形され、たばこロッドTRはラッピングセクション16の出口から送出される。

より詳しくは、トングシュー26は充填材層KLを上方から圧縮して、充填材層KLの上部を半円形の断面形状に成形し、一方、成形ベッド22の成形溝はガニチャテープ18を介してダブルウエブを断面U字形に曲成する。これにより、充填材層KLの下部もまた半円形の断面形状に成形される。つまり、充填材層KLは上下から圧縮され、円形の断面形状に成形される。

ショートホルダ28はガニチャテープ18を介して、ダブルウエブ、即ち、インナ及びアウタウエブW₁、W₂の一側縁部を円弧状に曲成し、これら一側縁部を充填材層KLの上部半分に被せる。一方、糊塗布ノズル30はダブルウエブの他側縁、即ち、アウタウエブW₂の他側縁にシーム糊を塗布する。

この後、ロングホルダ32はガニチャテープ18を介して、ダブルウエブの他側縁部を同様に円弧状に曲成して、この他側縁部を充填材層KLの残りの上部半分に被せる。従って、アウタウエブW₂の他側縁がシーム糊を介してアウタウエブW₂の一側縁に重ね合わされることで、アウタウエブW₂の両側縁は互いに接着され、この結果、たばこロッドTRが成形される。

ラッピングセクション16から送出されたたばこロッドTRは、ヒータ34の下側を通過する際、シーム糊の乾燥処理が行われる。この後、たばこロッドTRが切断セクション36を通過する際、切断セクション36のロータリナイフ38はたばこロッドTRを所定長毎に切断し、シガレットロッドCRを成形する。ここで、シガレットロッドCRは前述したダブルラッパーシガレット2の2倍の長

さを有する。この後、シガレットロッドCRはキッカー40により、フィルタシガレット製造機（図示しない）に向けて供給される。

5 フィルタシガレット製造機にシガレットロッドCRが供給されると、シガレットロッドCRは先ず2本のダブルラッパーシガレット2に切断され、これらダブルラッパーシガレット2間にフィルタプラグが配置される。この後、これら2本のダブルラッパーシガレット及びフィルタプラグはチップペーパ片の巻付けにより相互に接続され、これにより、ダブルフィルタシガレットが成形される。更に、ダブルフィルタシガレットは等分に切断され、第1図のフィルタシガレットが得られる。

10 第1図の製造機はノズルタイプの塗布器42を更に備えており、塗布器42はアウタウエブW₂の送出経路14に配置されている。より詳しくは、塗布器42はリザーバ15とラッピングセクション16との間に位置付けられている。

15 塗布器42はアウタウエブW₂の片面、即ち、その内面に香気発生液を塗布する。ここで、香気発生液の塗布域は、前述したシーム糊が塗布されるアウタウエブW2の他側縁を除いた領域に設定される。第5図に示されるようにラッピングセクション16の入口にて、香気発生液が塗布されたアウタウエブW₂とインナウエブW₁とが互いに重ね合わされると、これらウェブW₁、W₂間に香気発生液の塗布層44が形成される。

20 ここで、香気発生液は、シーム糊として使用されるEVA糊やPVAC糊を担持体とし、この担持体に前述した香料を混合して得られる。それ故、塗布層44はインナウエブW₁とアウタウエブW₂とを接着する接着剤としての機能をも有する。

25 担持体としてのPVAC糊はEVA糊やCMC糊に比べて、香料の保持能力に優れ、副流煙に向けて香料を良好に解放することができる。

上述したようにアウタラッパー材W₂の内面に塗布層44が形成されると、この塗布層44はダブルラッパーシガレット2の香気発生層10となる。

本発明は上述の一実施例に制約されるものではなく、種々の変形が可能である。

例えば、塗布器42はアウタウエブW₂の内面、筋状の塗布層44を複数形成することができる。

また、第4図中2点鎖線で示されるように、塗布器42が送出経路12に配置されていれば、塗布器42は、インナウエブW₁の片面、即ち、そのアウタウエブW₂側の内面に塗布層44を形成することができる。この場合、塗布層44はインナウエブW₁の内面全域に亘って拡がることができる。

更に、塗布器42は送出経路12、14のそれぞれに配置することもできる。この場合、インナ及びアウタウエブW₁、W₂の双方に塗布層44がそれぞれ形成され、インナラッパー6とアウタラッパー8との間により多くの香料を介在させることができる。

上述のノズルタイプの塗布器42に代えて、ローラタイプの塗布器を使用することもできる。ローラタイプの塗布器は転写ローラを有し、この転写ローラは、インナウエブW₁又はアウタウエブW₂に香料液を転写し、塗布層44を形成する。

更にまた、製造機は、粉状又は粒状の香気発生材料を供給する供給装置を備えることができる。具体的には、第6図に示されるように、供給装置は送出経路14に配置された糊塗布器46及び散布器48を含み、散布器48は糊塗布器46によりも下流に配置されている。糊塗布器46は、アウタウエブW₂の内面にPVC糊を塗布し、これにより、アウタウエブW₂の内面は接着面に形成される。この後、散布器48は粉状又は粒状の香気発生材料をアウタウエブW₂の接着面に散布し、香気発生材料は接着面に層状に付着される。

ここでの香気発生材料としては、デキストリン系の粉末香料又はカードラン粉末、更には、β-サイクロデキストリン等の担持体に前述した香料が含有された粉末香料を使用することができる。

上述したような香気発生材料を使用しても、インナウエブW₁とアウタウエブW₂との間に香気発生層を形成することができ、前述したダブルラッパーシガレ

ット2が得られる。

第6図中2点鎖線で示されているように、供給装置は送出経路12に配置されてもよいし、送出経路12、14の双方にそれぞれ配置されていてもよい。

前述した供給装置に代えて、第7図の供給装置を使用することもできる。

5 第7図の供給装置は糊塗布器50を含み、この糊塗布器50は送出経路12、14の少なくとも一方に配置され、糊ポット及び転写ローラを有する。糊塗布器50の転写ローラは糊ポット内のPVC糊をウエブの片面に塗布し、ウエブに接着面を形成する。

送出経路は、糊塗布器50の下流に上方に向けて斜めに延びる傾斜経路を有し、10 この傾斜経路に吹き上げ型の散布器52が配置されている。この散布器52はハウジング54及びカバー56を有し、これらハウジング54及びカバー56は傾斜経路を上下に挟み、且つ、傾斜経路に沿って配置されている。より詳しくは、ハウジング54は送出経路の下側に配置され、ハウジング54の上面は部分的に開口されている。一方、カバー56はハウジング54の上面を覆い、ウエブはハウジング54とカバー56との間を走行する。

ハウジング54内には粉状又は粒状の香気発生材料が収容されている一方、一対のブラシローラ58、60が回転可能に配置されている。これらブラシローラ58、60はウエブの走行方向に離間し、ブラシローラ58のみが香気発生材料中に部分的に埋まった状態にある。

20 ブラシローラ58、60が回転されると、上流側、即ち、下側のブラシローラ58はハウジング54内の香気発生材料をウエブに向けて吹き上げ、これにより、香気発生材がウエブの接着面に層状に付着される。この後、下流側、即ち、上側のブラシローラ60はウエブの接着面から余剰の香気発生材料を搔き落とし、この結果、ウエブに所望の量の香気発生材料が付着される。

請求の範囲

1. ダブルラッパーシガレットは、

喫煙材料からなるロッド状の充填材と、

前記充填材を包み込むインナラッパーと、

5 前記インナラッパーを囲むアウタラッパーと、

前記インナラッパーと前記アウタラッパーとの間に設けられた香料発生層と

を備え、

前記香料発生層は、副流煙の臭気を緩和するための香料を含む。

2. 請求項1のダブルラッパーシガレットにおいて、

10 前記インナラッパー及びアウタラッパーは、副流煙を低減するための充填剤を含む。

3. 請求項1のダブルラッパーシガレットにおいて、

前記香料発生層は、前記香料を担持する糊を更に含む。

4. 請求項3のダブルラッパーシガレットにおいて、

15 前記糊は、ポリビニールアセテート糊である。

5. 請求項3のダブルラッパーシガレットにおいて、

前記香料は粉状及び粒状の一方の形態を有する。

6. ダブルラッパーシガレットの製造機は、

インナウエブを送出する第1送出経路と、

20 アウタウエブを送出する第2送出経路と、

前記第1及び前記第2送出経路から前記インナウエブ及び前記アウタウエブを

それぞれ受け取って、前記インナウエブ及び前記アウタウエブを互いに重ね合わ

せたダブルウエブを形成する一方、前記ダブルウエブ上に喫煙材料からなる充填

材の供給を受け、前記充填材を前記ダブルウエブにより包み込んで、たばこロッド

25 ドを連続的に成形するラッピングセクションと、

前記ラッピングセクションにて成形された前記たばこロッドを所定の長さ毎に

切断する切断セクションと、

前記第1及び第2送出経路の少なくとも一方に設けられた香料供給装置と
を備え、

前記香料供給装置は、前記一方の送出経路のウェブに香料を含んだ材料を層状
5 に付着させ、前記ダブルウェブの前記インナウェブと前記アウタウェブとの間に
香気発生層を形成する。

7. 請求項6の製造機において、

前記香料供給装置は、

前記ウェブに前記香料を含んだ香気発生液を塗布するノズル型塗布器を含む。

10 8. 請求項6の製造機において、

前記香料供給装置は、

前記ウェブに糊を塗布して、接着面を形成する糊塗布器と、

前記ウェブの前記接着面に粉状又は粒状の香気発生材料を散布する散布器と
を含む。

15 9. 請求項8の製造機において、

前記散布器は、

前記送出経路の下方に回転可能に配置され、前記ウェブの前記接着面に向けて
前記香気発生材料を吹き上げる第1ブラシローラと、

前記第1ブラシローラの下流に回転可能に配置され、前記接着面に付着した余
20 剰の香気発生材料を搔き落とす第2ブラシローラと
を含む。

10. ダブルラッパーシガレットの製造方法は、

シガレット製造機のラッピングセクションに向けてインナウェブ及びアウタ
エブをそれぞれ供給して、前記ラッピングセクションの入口にて前記インナウェ
ブ及び前記アウタウェブが互いに重なり合ったダブルウェブを形成する工程と、
25 前記インナウェブ及び前記アウタウェブの供給過程にて、前記インナウェブ及

び前記アウタウエブの少なくとも一方に香料を含んだ材料を層状に付着させ、前記ダブルウエブの前記インナウエブと前記アウタウエブとの間に香気発生層を形成する工程と、

前記ラッピングセクションの入口にて前記ダブルウエブに喫煙材料からなる充

5 填材を供給する工程と、

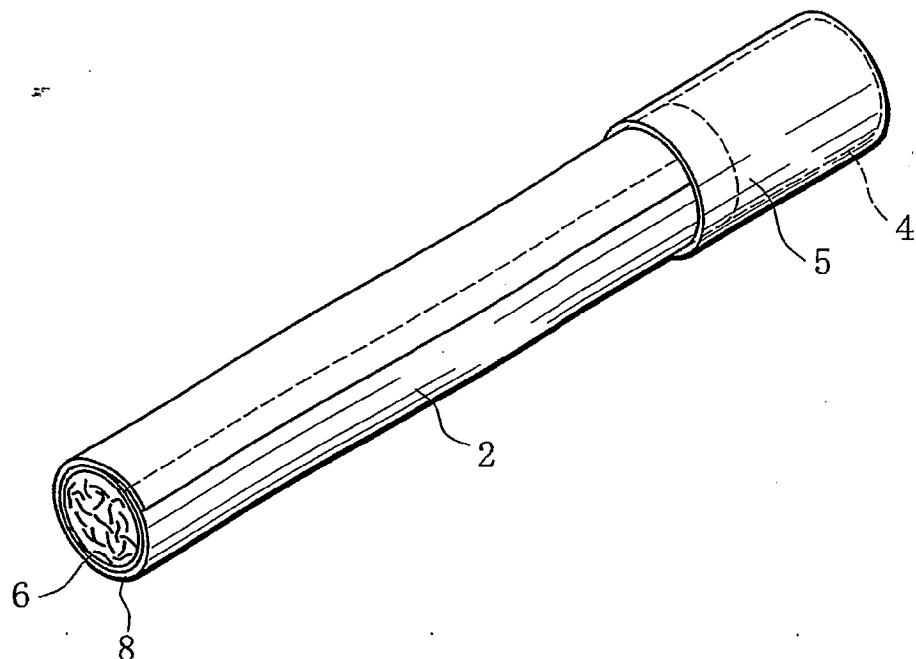
前記ダブルウエブが前記充填材とともに前記ラッピングセクションを通過する際、前記ダブルウエブにより前記充填材を包み込み、たばこロッドを連続して形成する工程と、

この後、前記たばこロッドを所定長さ毎に切断する工程と

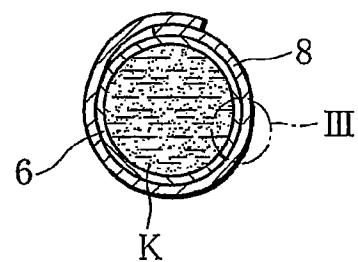
10 を備える。

1/4

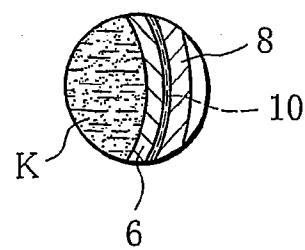
第 1 図



第 2 図

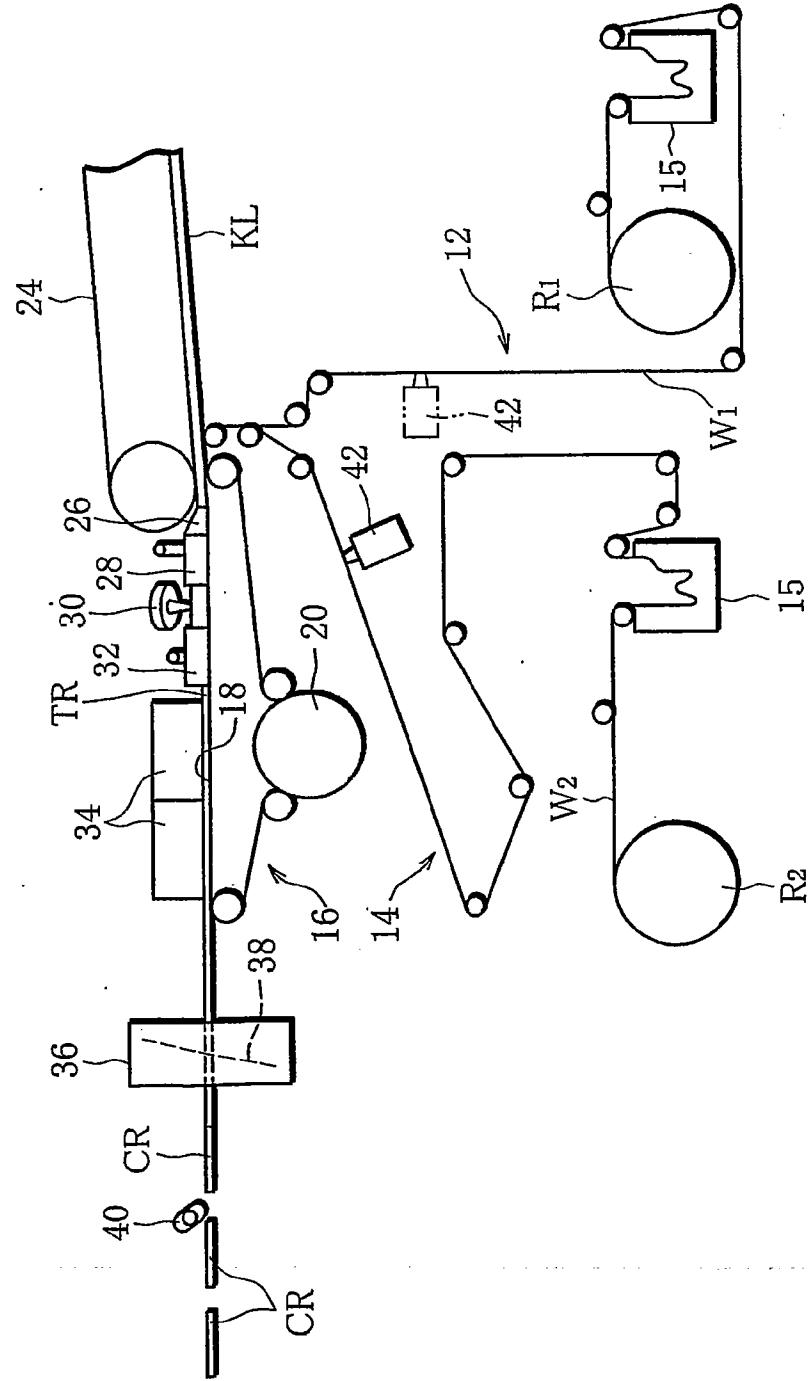


第 3 図



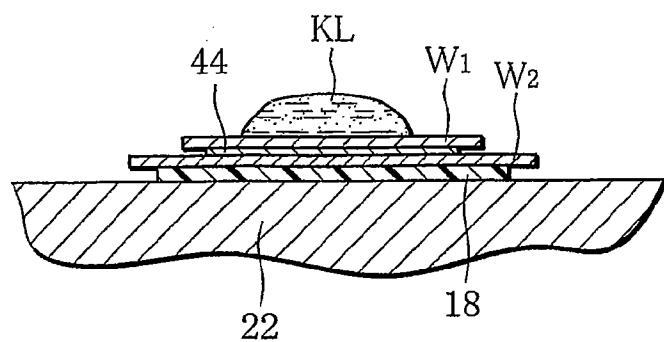
2/4

第4回

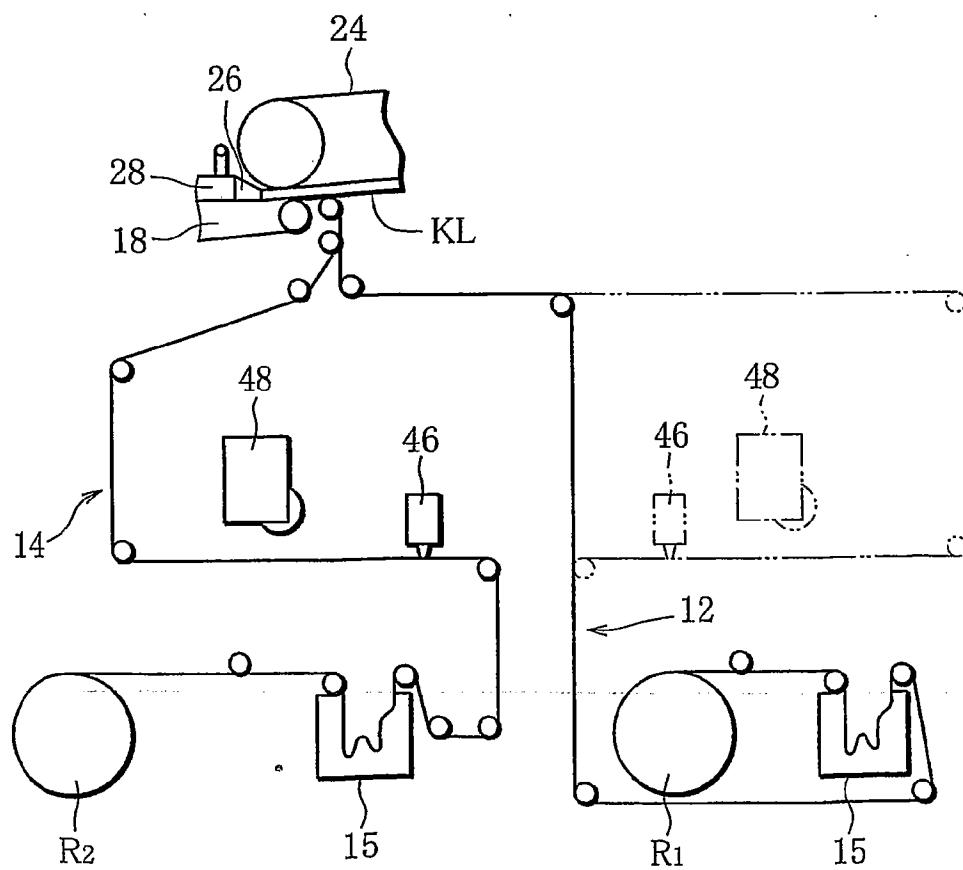


3/4

第 5 図

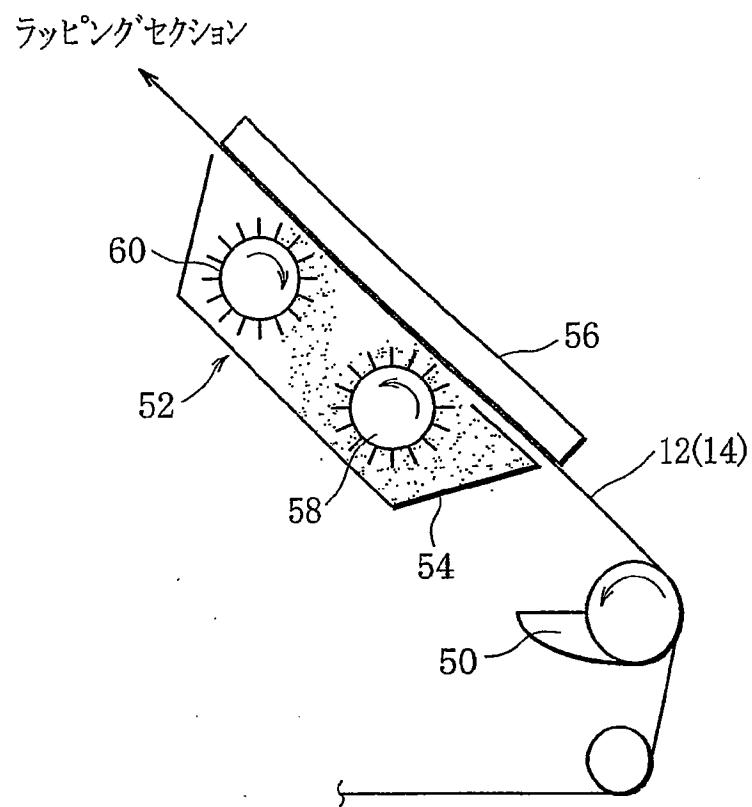


第 6 図



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第 7 図



A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl⁷ A24C5/46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ A24C5/46

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
 Jitsuyo Shinan Koho 1926-1996 Toroku Jitsuyo Shinan Koho 1994-2002
 Kokai Jitsuyo Shinan Koho 1971-1996 Jitsuyo Shinan Toroku Koho 1996-2002

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	WO 99/35923 A1 (Japan Tobacco Inc.), 22 July, 1999 (22.07.99), & EP 1050223 A1 & AU 1891499 A & TW 387799 B	1-5 6-10
Y A	US 5709228 A (Rothmans, Benson & Hedges, Inc.), 20 January, 1998 (20.01.98), & DE 69007791 C & JP 4-501805 A & ZA 9004220 A & CA 2054745 A & AU 5733990 A & GB 8914267 A	1-5 6-10

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
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Date of the actual completion of the international search
28 August, 2002 (28.08.02)

Date of mailing of the international search report
10 September, 2002 (10.09.02)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 11-178562 A (Japan Tobacco Inc.), 06 July, 1999 (06.07.99), (Family: none)	1-5
A		6-10
Y	JP 2000-96493 A (Japan Tobacco Inc.), 04 April, 2000 (04.04.00), & JP 2938067 B	1-5
A		6-10
Y	US 5979461 A (Philip Morris Inc.), 09 November, 1999 (09.11.99), (Family: none)	2
A	US 5462073 A (Rothmans, Benson & Hedges, Inc.), 31 October, 1995 (31.10.95), & US 5699812 A1 & JP 6-220800 A & DE 69229570 T & AU 644927 B & ZA 9200049 A & CA 2057962 A & GE 9100196 A & AU 1001292 A & EP 495567 A3 & GB 9114598 A & GB 9110559 A & GB 9108783 A & GB 9103202 A	1-10
A	EP 559300 A3 (Philip Morris Products Inc.), 06 February, 1990 (06.02.90), & US 4998542 A1 & EP 386884 A2 & AU 5001890 A & FI 900903 A & HU 56256 A & IL 93261 D & CA 2010575 A & NO 900837 A & NO 931828 A & PT 93230 A & CN 1045020 A & JP 2-243000 A & ZA 9000902 A & BR 9000856 A & PL 283926 A & TR 24329 A & NZ 232308 A & AU 623977 B & YU 24890 A & SU 1804312 A	1-10

A. 発明の属する分野の分類(国際特許分類(IPC))

Int. C17 A24C 5/46

B. 調査を行った分野

調査を行った最小限資料(国際特許分類(IPC))

Int. C17 A24C 5/46

最小限資料以外の資料で調査を行った分野に含まれるもの

日本国実用新案公報 1926-1996

日本国公開実用新案公報 1971-1996

日本国登録実用新案公報 1994-2002

日本国実用新案登録公報 1996-2002

国際調査で使用した電子データベース(データベースの名称、調査に使用した用語)

C. 関連すると認められる文献

引用文献の カテゴリー*	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	関連する 請求の範囲の番号
Y A	WO 99/35923 A1 (日本たばこ産業株式会社) 199 9. 07. 22 & EP 1050223 A1 & JP 1 1-266851 A & AU 1891499 A & CN 1288356 T & TW 387799 B	1-5 6-10

 C欄の続きにも文献が列挙されている。 パテントファミリーに関する別紙を参照。

* 引用文献のカテゴリー

- 「A」特に関連のある文献ではなく、一般的技術水準を示すもの
 「E」国際出願日前の出願または特許であるが、国際出願日以後に公表されたもの
 「L」優先権主張に疑義を提起する文献又は他の文献の発行日若しくは他の特別な理由を確立するために引用する文献(理由を付す)
 「O」口頭による開示、使用、展示等に言及する文献
 「P」国際出願日前で、かつ優先権の主張の基礎となる出願

の日の後に公表された文献

- 「T」国際出願日又は優先日後に公表された文献であって出願と矛盾するものではなく、発明の原理又は理論の理解のために引用するもの
 「X」特に関連のある文献であって、当該文献のみで発明の新規性又は進歩性がないと考えられるもの
 「Y」特に関連のある文献であって、当該文献と他の1以上の文献との、当業者にとって自明である組合せによって進歩性がないと考えられるもの
 「&」同一パテントファミリー文献

国際調査を完了した日

28.08.02

国際調査報告の発送日

10.09.02

国際調査機関の名称及びあて先

日本国特許庁 (ISA/JP)

郵便番号 100-8915

東京都千代田区霞が関三丁目4番3号

特許庁審査官(権限のある職員)

千葉 成就

3B

8207

電話番号 03-3581-1101 内線 3320

C (続き) 関連すると認められる文献

引用文献の カテゴリー*	引用文献名 及び一部の箇所が関連するときは、その関連する箇所の表示	関連する 請求の範囲の番号
Y A	US 5709228 A (Rothmans, Benson&Hedges, Inc.) 1998. 01. 20 & DE 690 07791 C & AU 639239 B & JP 4-5 01805 A & EP 474706 A & ZA 900 4220 A & WO 90/14776 A & CA 20 54745 A & GB 8912688 A & AU 57 33990 A & GB 8917089 A & GB 89 14267 A	1-5 6-10
Y A	JP 11-178562 A (日本たばこ産業株式会社) 1999. 07. 06 (ファミリーなし)	1-5 6-10
Y A	JP 2000-96493 A (日本たばこ産業株式会社) 2000. 04. 04 & JP 2938067 B	1-5 6-10
Y	US 5979461 A (Philip Morris Inc.) 1999. 11. 09 (ファミリーなし)	2
A	US 5462073 A (Rothmans, Benson&Hedges, Inc.) 1995. 10. 31 & US 5699812 A1 & JP 6-220800 A & DE 69229570 T & AU 644927 B & ZA 9200049 A & CA 2057962 A & GB 9100196 A & AU 1001292 A & EP 495567 A3 & GB 9114598 A & GB 9110559 A & GB 9108783 A & GB 9103202 A	1-10
A	EP 559300 A3 (Philip Morris Products Inc.) 1990. 02. 06 & US 4998542 A1 & EP 386884 A2 & AU 5001890 A & FI 900903 A & HU 56256 A & IL 93261 D & CA 2010575 A & NO 900837 A & NO 931828 A & PT 93230 A & CN 1045020 A & JP 2-243000 A & ZA 9000902 A & BR 9000856 A & PL 283926 A & TR 24329 A & NZ 232308 A & AU 623977 B & YU 24890 A & SU 1804312 A	1-10